ORDER NO. HAD8605514C8

Service Manual

Tuner

ST-500/500L

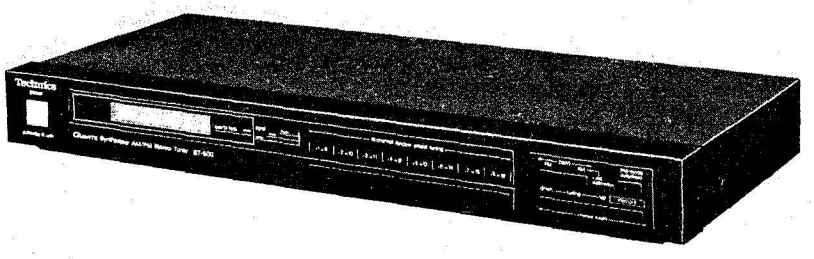
QUARTZ Synthesizer AM/FM Stereo Tuner
(ST-500)

QUARTZ Synthesizer LW/MW/FM Stereo Tuner
(ST-500L)

ST-500
ST-500L

Color

(K)...Black Type
(S)...Silver Type



* This photo is **ST-500**.

Color	Areas
(K) (S)	[EX]....Continental Europe. (ST-500)
(K) (S)	[EK]....United Kingdom. (ST-500L)
(K) (S)	[EB]....Belgium. (ST-500L)
(K) (S)	[EH]....Holland. (ST-500)
(K) (S)	[EF]....France. (ST-500L)
(K) (S)	[EW]...Switzerland. (ST-500L)
(K) (S)	[EI].....Italy. (ST-500)
(K) (S)	[XA]....Asia, Oceania, Latin America, Middle Near East and Africa. (ST-500)
(K) (S)	[XL]....Australia. (ST-500)

SPECIFICATIONS

(DIN 45 500)

01070123 91000123 02
SM-ST500 2 ST
SVC MNL

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz (0.05 MHz step)
Sensitivity	1.5 μV/75Ω (IHF '58)
S/N 30 dB	1.3 μV (75Ω)
S/N 26 dB	1.2 μV (75Ω)
S/N 20 dB	0.9 μV (75Ω)
IHF 46 dB stereo quieting sensitivity	22 μV/75Ω
Total harmonic distortion	
MONO	0.15%
STEREO	0.3%
S/N	
MONO	70 dB (78 dB, IHF '58)
STEREO	65 dB (70 dB, IHF '58)
Frequency response	20 Hz~15 kHz, +0.5 dB~−1.5 dB
Alternate channel selectivity	
normal ±400 kHz	65 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	40 dB
IF rejection at 98 MHz	70 dB
Spurious response rejection at 98 MHz	70 dB
AM suppression	55 dB
Stereo separation	
1 kHz	40 dB
10 kHz	30 dB
Carrier leak	
19 kHz	−30 dB (−35 dB, IHF)
38 kHz	−45 dB (−50 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	75Ω (unbalanced)

■ AM (MW) TUNER SECTION

Frequency range	522~1611 kHz (9 kHz-steps) 530~1620 kHz (10 kHz-steps)
Sensitivity (S/N 20 dB)	20 μV, 300 μV/m
Selectivity (±9 kHz)	55 dB
Image rejection at 999 kHz	40 dB
IF rejection at 999 kHz	60 dB

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ LW TUNER SECTION (ST-500L only)

Frequency range	155~353 kHz 153~351 kHz (–2 kHz shift)
Sensitivity (S/N 20 dB)	50 μV
Selectivity at 254 kHz	55 dB
Image rejection at 254 kHz	40 dB
IF rejection at 254 kHz	60 dB

■ GENERAL

Output voltage	0.3V (0.6V, IHF)
Power consumption	9 W
Power supply	
For Australia and United Kingdom	AC 50 Hz/60 Hz, 240V
For continental Europe	AC 50 Hz/60 Hz, 220V
For others	AC 50 Hz/60 Hz, 110V/127V/220V/240V
Dimensions (W×H×D)	430 × 53 × 200 mm (16-15/16" × 2-2/32" × 7-27/32")
Weight	1.8 kg (3.9 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

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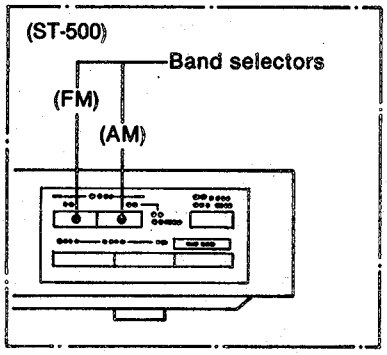
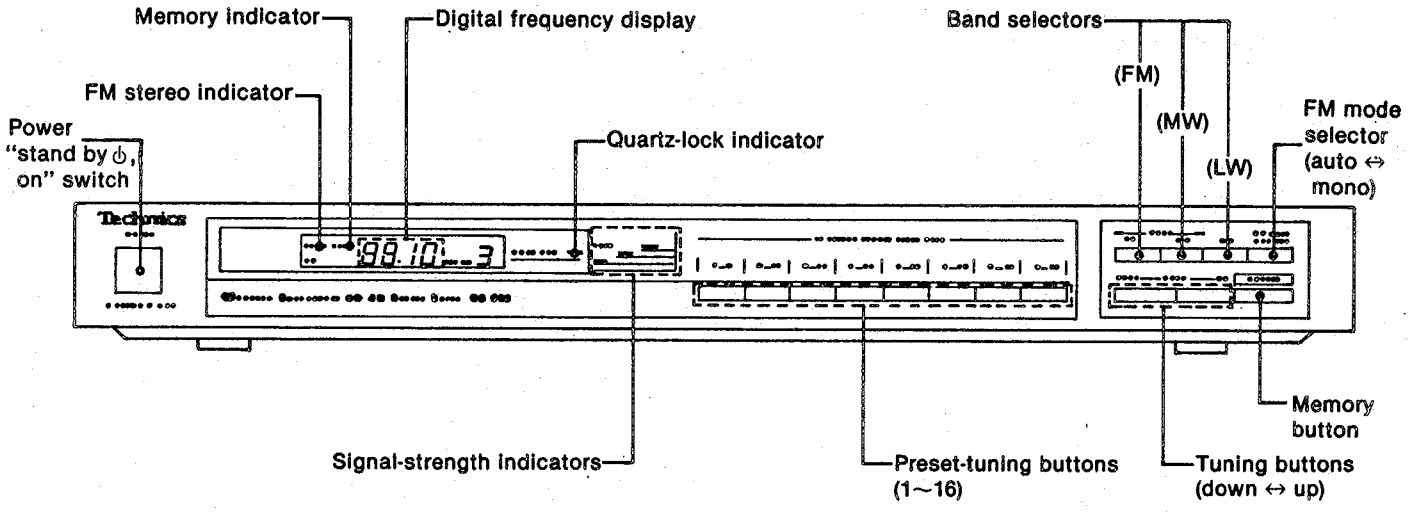
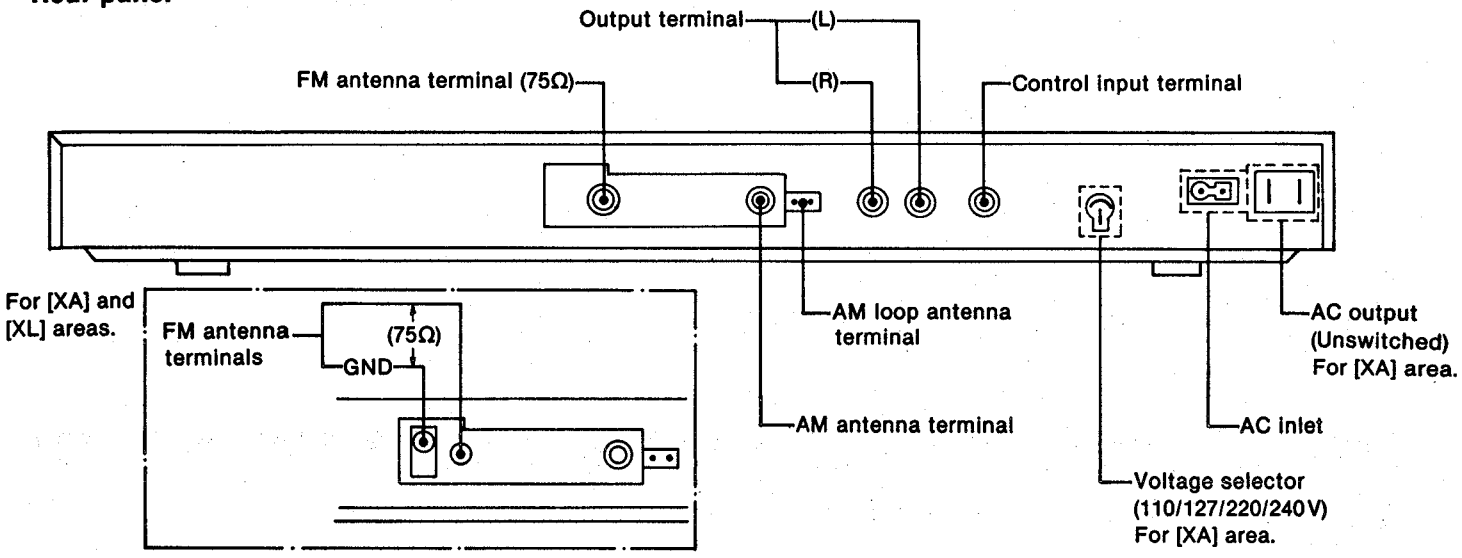
■ LOCATION OF CONTROLS

• **Front panel (ST-500L)**



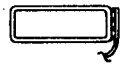


• **Rear panel**



■ LISTENING TO RADIO BROADCASTS

Important!



AM loop antenna

If this antenna is not installed, AM broadcasts will not be received.

1 Turn the amplifier on, and set it for listening to radio broadcasts.

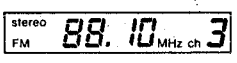
2 "on" (■→ ▬)

3 Select the desired station by using either the manual or preset-tuning buttons.

For station selection using preset-tuning buttons

- **To select the front channels (CH 1 ~ 8):**

Press momentarily. ➡ Frequency stored in the memory and channel number are displayed.



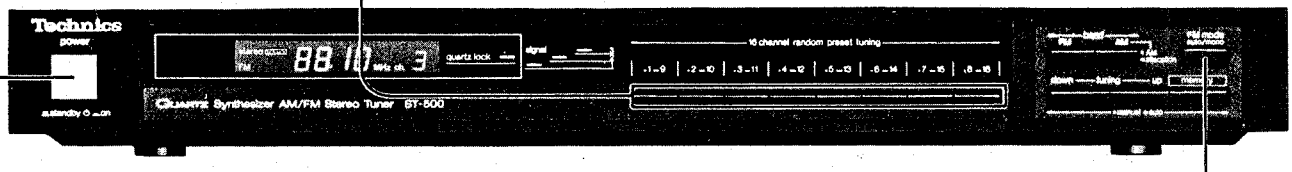
- **To select the back channels (CH 9 ~ 16):**

Press slightly longer ➡ Frequency stored in the memory and channel number are displayed.

For manual station selection.

Follow step 2, 3 of "Manual memory presetting"

ST-500



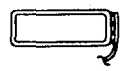
FM mode selector (FM mode)

If the broadcast signal is weak, or if there is a large amount of interference in a stereo broadcast, set to the monaural position. Note that the FM stereo indicator will not illuminate in this position.

■ MEMORY PRESETTINGS

The indication AM used here includes both MW and LW for Model ST-500L.

Important!



AM loop antenna

If this antenna is not installed, AM broadcasts will not be received.

With this unit you may preset as many as 16 radio broadcast stations: FM/AM random presetting. After broadcast stations have been preset as described below, any desired station can be quickly and easily selected by simply touching one button.

Notes:

1. For automatic presetting in areas where there are less than 16 FM stations, the remaining channels (through channel 16) will be left empty. The empty channels can be filled by using manual memory presetting.
2. If a new broadcasting station is preset into a channel, the broadcasting station which was previously entered in that channel will be automatically erased.
3. For AM broadcasts with extremely strong signal transmissions, the frequency memorized may be slightly different from the correct frequency. If this occurs, use the manual control to memorize.

Automatic memory presetting

ST-500 The FM broadcasting stations and AM broadcasting stations will be automatically preset to "channels" 1 through 16 for FM and 9 through 16 for AM, respectively.

ST-500L The FM broadcasting stations, MW broadcasting stations, and LW broadcasting stations will be automatically preset in "channels" 1 through 16 for FM, 9 through 16 for MW, and 13 through 16 for LW, respectively.

Note: When AM is automatically preset, the FM stations on "channels" 9 through 16 will be replaced by the new AM stations.

1 "on" (■→ ▲)

2 **ST-500** **"FM":** for FM broadcasts **"AM":** for AM broadcasts

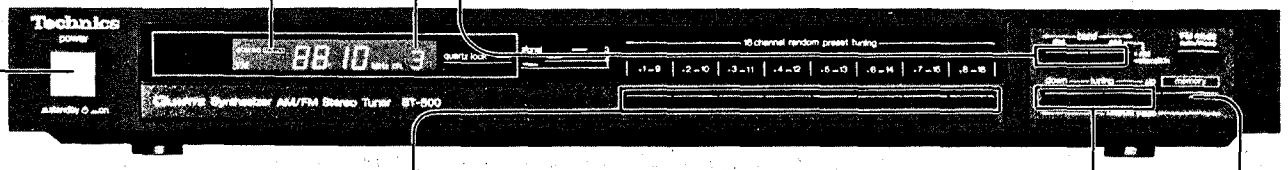
ST-500L **"FM":** for FM broadcasts **"MW":** for MW broadcasts **"LW":** for LW broadcasts

Before presetting the broadcasting stations, press to select the appropriate frequency step for your locality.

Channel display

Memory indicator

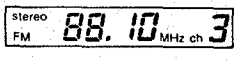
ST-500



5 **Confirm the names (call signs, etc.) of the broadcasting stations which are preset to each channel, and enter them on the file sheet.**

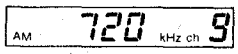
• ***To check the front channels (CH 1 ~ 8)***
Press momentarily.

Frequency stored in the memory and channel number are displayed.



• ***To check the back channels (CH 9 ~ 16)***
Press slightly longer.

Frequency stored in the memory and channel number are displayed.



3 **Set to the lowest frequency.**

Tuning Press the left button to change the frequency downward, and press the right button to change the frequency upward.

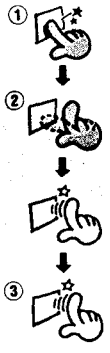
ST-500
- **FM: 87.50 MHz**
- **AM: 522 kHz** (9 kHz step) **or 530 kHz** (10 kHz step)

ST-500L
- **FM: 87.50 MHz**
- **MW: 522 kHz** (9 kHz step) **or 530 kHz** (10 kHz step)
- **LW: 153 kHz** (– 2kHz shift) **or 155 kHz**

① Press the button and hold slightly (frequency will change continuously).

② Release it when approaching the above exact frequency, and then press the button again momentarily (frequency change will stop).

③ Press the button momentarily (frequency will change each time the button is pressed), and tune to one of the above frequencies.



4 **Press. When the frequency indication begins to change, release.**

The frequency will change upward, and the automatic presetting will begin with the next broadcasting station.
It will continue to preset consecutive broadcast stations.

■ "Most-recent" memory

The most-recent memory is a system by which the unit "remembers" the FM or AM broadcast station last heard when this unit is turned off, and automatically tunes to that station the next time the power is turned on.

■ "Back-up" memory

This is the function which preserves the preset memory and most-recent memory functions. In the event of a power failure, or if the power cord of the tuner is disconnected from the electric outlet, the back-up memory will preserve the preset memory and most-recent memory functions for as long as approximately one week.

■ To prevent erasing the memory

If the power supply is interrupted for one week or longer, the memory settings will be erased.

For example:

1) If the power cord is disconnected from the electric outlet,
2) If an audio timer is used and the timer does not operate the tuner for a week or longer,
3) If a power failure occurs, etc.

If any of the above occurs, the memory will have to be reset. The memory in this unit is maintained by a gold capacitor. If the power supply is interrupted for a week or longer, set the power switch of the tuner to the "on" position for thirty minutes or more in order to recharge the gold capacitor. Then reprogram the memory.

Manual memory presetting

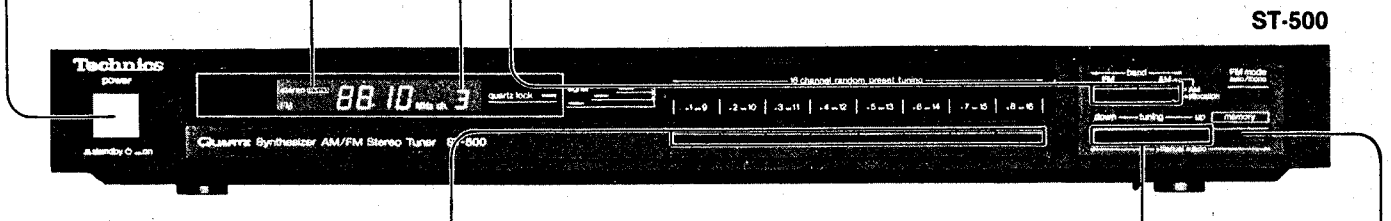
Stations can be freely preset to any desired channel.

1 "on" (■→ ▬)

2 ST-500 "FM": for FM broadcasts "AM": for AM broadcasts

ST-500L "FM": for FM broadcasts "MW": for MW broadcasts "LW": for LW broadcasts

Before presetting the broadcasting stations, press to select the appropriate frequency step for your locality.



5 **While the memory indicator is illuminated, press the button of the desired channel.**

When the button is pressed, the memory indicator illumination will stop, and the presetting is complete.

- **To preset channels 1 through 8:**
  Press the appropriate button momentarily, and then release. (Preset channel number is displayed on the channel display.)
- **To preset channels 9 through 16:**
  Press the appropriate button slightly longer, and then release. (Preset channel number is displayed on the channel display.)

Note:
If the memory indication illumination stops before you press the button, once again repeat step 4 and then step 5.

6 **Enter the name (call sign, etc.) of the preset broadcasting station on the station memory file sheet.**

This completes the procedures for presetting radio broadcast frequencies. The other preset-tuning buttons can be preset in the same way by following steps 2 through 6.

3 **Press the appropriate tuning button to tune to the desired broadcast.**

Tuning

Press the left button to change the frequency downward, and press the right button to change the frequency upward.

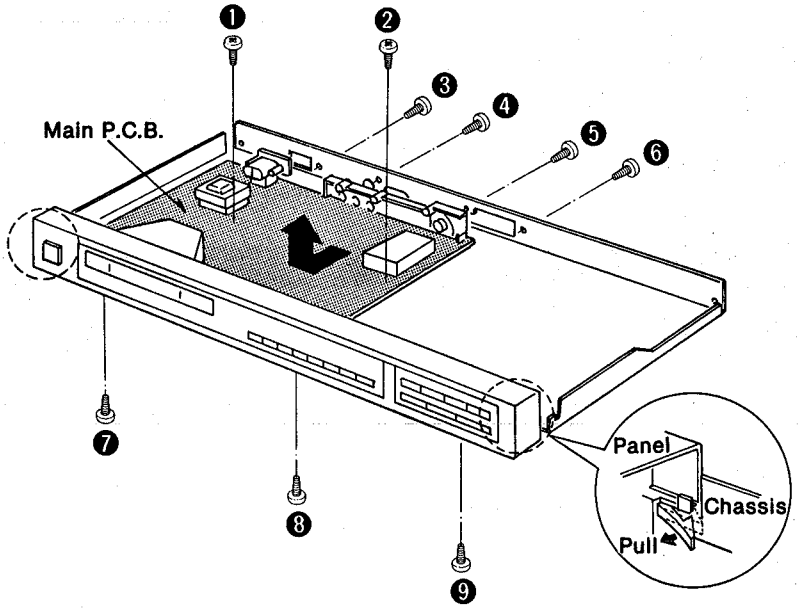
- **Automatic tuning**
  Press the button. When the frequency indication begins to change, release the button (a broadcasting station will be selected automatically). Repeat this operation until the desired station is found.
- **Manual tuning**
  Press the button momentarily and tune to the desired station. The frequency will change each time the button is pressed.

4 **Press momentarily, and then release.**
(The memory indicator will illuminate for approximately 4 seconds.)

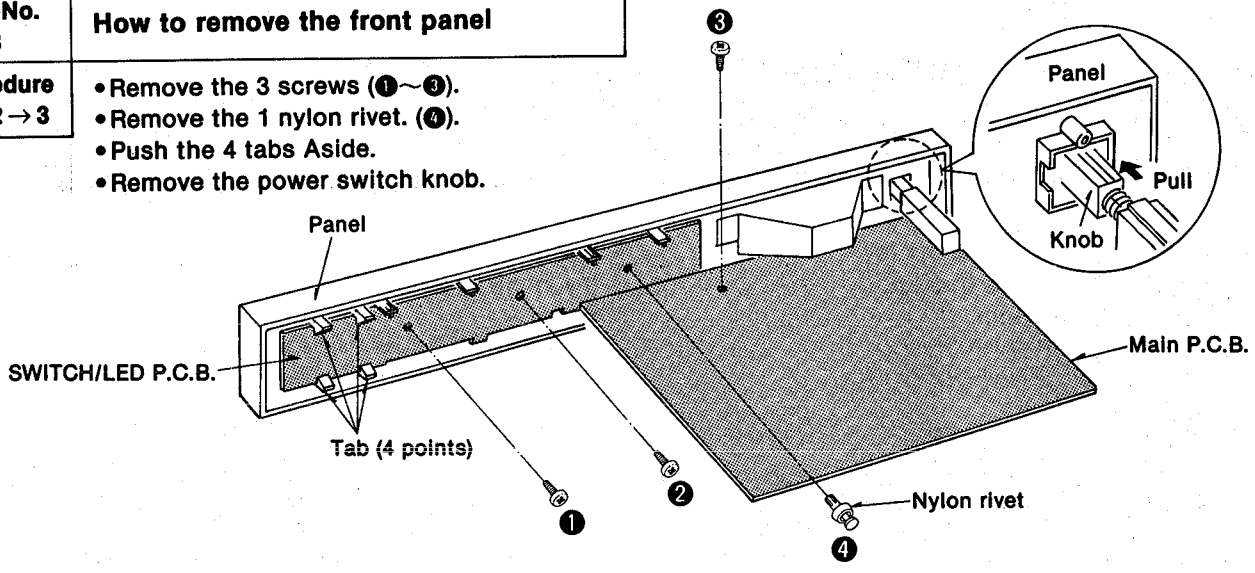
Note:
If the button is pressed continuously, the frequency will begin to change, and the memory will be preset automatically.
To stop the automatic memory presetting, once again press either the "up" button or the "down" button.

■ DISASSEMBLY INSTRUCTIONS

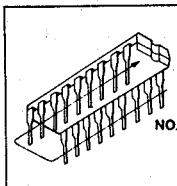
Ref. No. 1	How to remove the cabinet	Ref. No. 2	How to remove the main P.C.B.
Procedure 1	• Remove the 4 screws.	Procedure 1→2	• Remove the 9 screws (❶~❾).



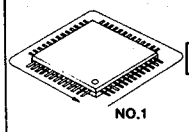
Ref. No. 3	How to remove the front panel
Procedure 1→2→3	• Remove the 3 screws (❶~❸). • Remove the 1 nylon rivet. (❹). • Push the 4 tabs Aside. • Remove the power switch knob.



■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

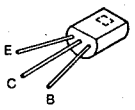


AN7273A	18 Pin
AN7470	16 Pin

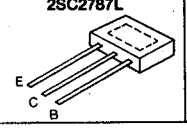


μPD1708G571	52 Pin

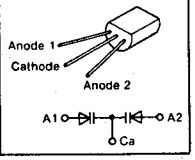
2SC1384A-R
2SC1685S



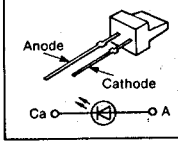
2SA1309Q
2SC3311Q
2SC2785F
2SC2787L



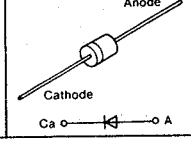
kV1260Z



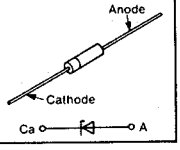
LN446YP, LN846RP



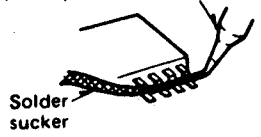
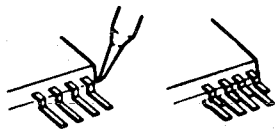
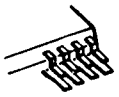
MA165, 1SR35200
MA160LF



MA4062M, MA4150M



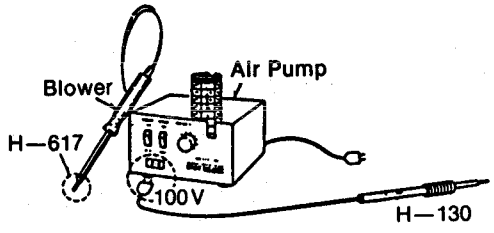
■ HOW TO REPLACE IC'S (Small outline type)

Replacing procedure			Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H—130 	• Recommended tool .....Special soldering iron * H605M and H-130. * H605E and H-130. • Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. • When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. • When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

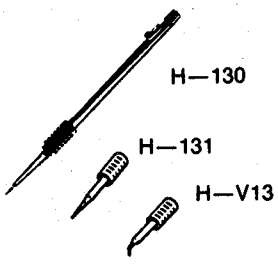
*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

•H—605 Spot Heater (hot-air solder iron)
This device that uses hot air to melt solder was developed to remove Flat-Pakage ICs, RHCs and chip parts.

- H—605M (For 120V power source)
- H—605E (For 200V/220V/240V power source)



H—617



•H—617 Twin Nozzle (for spot heater)
Special nozzle for the removal of RHCs and chip resistors. (Nozzle diameter: 1.0mm×2)

•H—130 Slim Pencil Solder Iron
An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs etc., to high-density circuit boards.
Features:

• Rated power:	100V, 15W
• Max. temp.:	400°C
• Heater:	ceramic (long life)
• Insulation resistance:	100MΩ
• Length:	178mm
• Weight:	16g (not including cord)

•H—131, H—V13 Cap Bits
Solder tip for the slim pencil Solder Iron and is composed of a bit holder and a corrosion resistance solder tip.
Permits changing of solder tips even while still hot.

• Solder tip:	0.3mm

■ MEASUREMENTS AND ADJUSTMENTS

■ AM/FM (ST-500)
LW/MW/FM (ST-500L)

Control positions and equipment used

- AM and FM signal generator (AM and FM-SG)
- Stereo modulator
- Distortion analyser
- Oscilloscope
- AC and DC electronic voltmeter (EVM)
- Frequency counter
- Choke coil (100μH)
- Resistor (100kΩ)
- Ceramic capacitor (200pF)

Note: For **T201 (AM (MW)-IFT), L204 (AM (MW) OSC coil)** and **L205 (LW ANT coil)**, adjusted parts are supplied. So, do not turn the cores of this parts.

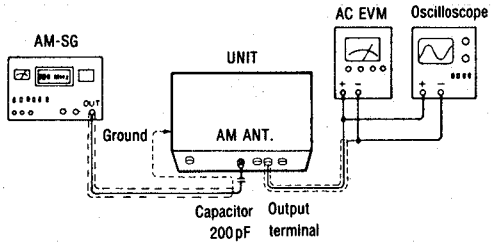
AM (MW)-RF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**AM (MW)**" position.
3. Place the radio dial and signal generator setting to **612kHz.**
4. Adjust **L205 (AM), L203 (MW)** for maximum output.
5. Place the radio dial and signal generator setting to **1503kHz.**
6. Adjust **CT202 (AM), CT201 (MW)** for maximum output.
7. Repeat steps 3.~6.

Note:

Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation.....30%
Modulation frequency.....400Hz



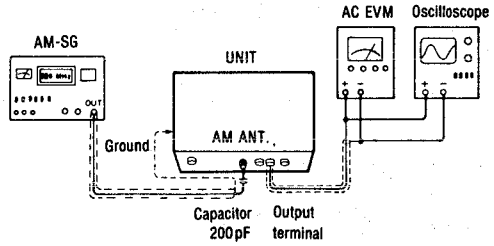
LW-RF ADJUSTMENT (ST-500L only)

1. Test equipment connection is shown in figure.
2. Set the unit to "**LW**" position.
3. Place the radio frequency display and signal generator setting to **155kHz.**
4. Adjust **L206** for maximum output.
5. Place the radio frequency display and signal generator setting to **353kHz.**
6. Adjust **CT202** for maximum output.
7. Repeat steps 3.~6.

Note:

Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation.....30%
Modulation frequency.....400Hz



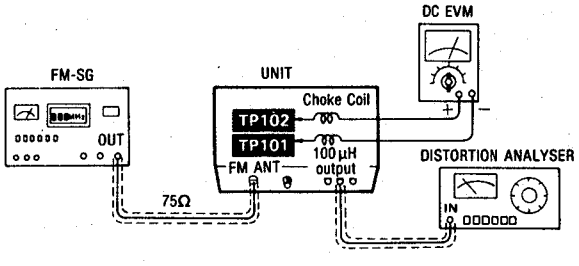
FM MONO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**FM**" position.
3. Place the radio frequency display and signal generator setting to **100.10MHz.**
4. Adjust **T101** core so that voltage measured in signal mode is **0mV (0±50mV)** in 1V range.
5. Adjust **T102** so that the distortion factor of Lch is minimized.
6. Repeat steps 4 and 5 a few times.
7. Make sure that the distortion factors of Lch and Rch are at minimum and nearly equal.

Note:

The adjusting screwdriver used should be made of resin.

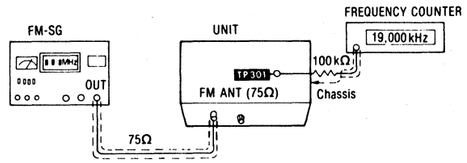
FM SIGNAL GENERATOR CONDITION
Modulation.....100%
Modulation frequency.....400Hz
Output level.....66dB



MPX VCO ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**FM auto**" position.
3. Place the radio dial and signal genarator setting to **100.10MHz**.
4. Adjust **VR302** for **19kHz±50Hz** on frequency counter reading.

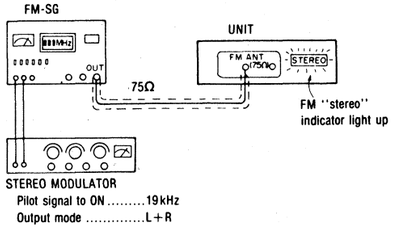
FM SIGNAL GENERATOR CONDITION
Modulation 0
Modulation frequency.....0
Output level.....66dB

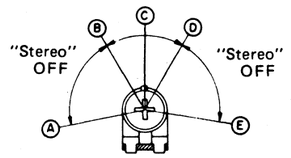


★ USING ALTERNATE SYSTEM

1. Apply stereo signal from generator or receive the stereo boardcast.
2. Adjust **VR302** until stereo indicator lights up. Cement arm of **VR302** as shown in figure.

FM SIGNAL GENERATOR CONDITION
Modulation 10%
Modulation frequency.....Pilot (19kHz)
Output level.....66dB

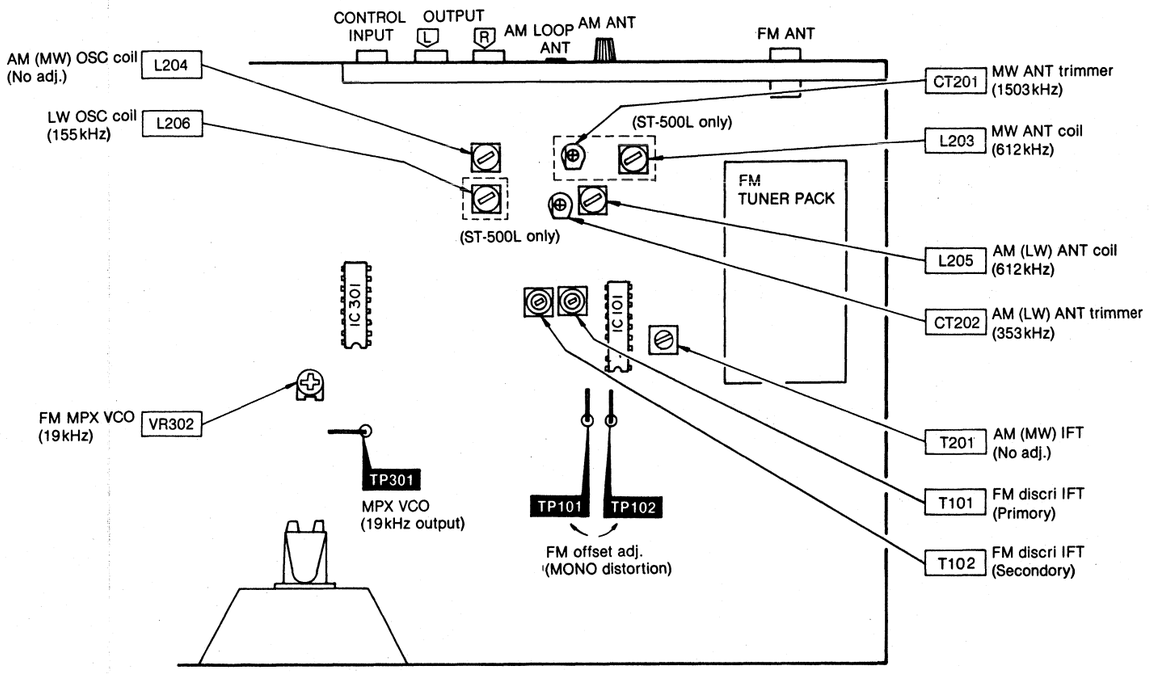




VR302

Ⓐ—Ⓑ,
Ⓓ—Ⓔ.....“Stereo” OFF position
Ⓑ—Ⓓ.....“Stereo” ON position
(Indicator lighting)
Ⓒ.....Adjust point of pilot circuit

• Adjustment points



■ FUNCTION OF TERMINAL (PLL controller IC901: μPD1708G571)

PIN NO.	IN/OUT	MARK	DESCRIPTION OF TERMINAL
1 ~ 4, 34 ~ 52	OUTPUT	LCD4 ~ LCD1, LCD23 ~ LCD5	Segment signal output terminal for display.
5	OUTPUT	COM2	Common signal output terminal connected to LCD. Output is delivered in 3 values of ground, 1/2V_{DD} and V_{DD} (at 5ms intervals) in a period of 50Hz. The segment turns ON when the difference in voltage is ±V_{DD} between these terminals and LCD1~LCD23.
6		COM1	
7	INPUT	V_{DD}	Power supply terminal of device. Voltage of 5V±10% is supplied during operation of device. To hold the internal date memory (RAM), the voltage can be decreased to 2.5V. **Note:** Pins 7 and 33 are connected inside the chip. It is unnecessary to supply voltage to the pins.
33		V_{DD}	
8	INPUT	FM	Input is local oscillator output (VCO) in a range of 10~130MHz (0.3Vp-p, min.). There are 1/2 fixed frequency division prescaler and 2-step (1/32, 1/33) prescaler internally. Therefore, when deciding the frequency dividing value of programmable divider, it must be decided from the frequency obtained by halving the local oscillator output (VCO).
9	INPUT	AM	Input is local oscillator output (VCO) in a range of 0.5~20MHz (0.1Vp-p, min.). When the mode is shifted to FM, the AM terminal voltage automatically becomes the supply voltage of device.
10	———	GND	Ground terminal.
11	OUTPUT (ST-500L only)	E01	When the divided oscillator frequency is higher than the standard frequency, H-level output is delivered from these terminals. When it is lower, L-level (0V) output is delivered. When they coincide, it results in floating.
12	OUTPUT	E02	
13	INPUT	CE	Device selection signal input terminal. The signal level should be high when the device is operated, and low when not operated. With this terminal shifted to low level, LCD (liquid crystal display) turns off and the memory is held.
14	———	NC	Not used in this unit.
15	OUTPUT	X1	Connecting terminal for crystal oscillator. The crystal connected is 4.5MHz.
16	INPUT	X2	
17	INPUT	SD	Terminal to put in stop signal during auto tuning. The voltage is 5V with broadcast received, and 0V without broadcast received.
18	INPUT	REMOTE CONTROL	This is the interrupt demand signal input terminal. The signal from the control input terminal is put into this terminal, demanding for interruption, then the flow of program will be unconditionally shifted to the address No. 1.
19	OUTPUT	FM	FM/AM output terminal. (FM → 5V, AM → 0V)
20	OUTPUT	LW/FM MONO	Auto/mono changeover output terminal. (auto → 0V, mono → 5V)
21 ~ 24	INPUT	KEY3 ~ KEY0	Input terminal for key return signal from external key matrix.
25 ~ 28	OUTPUT	PB3 ~ PB0	Output terminal for key return signal to external key matrix.
29	OUTPUT	PC3	Terminal for FM IF ceramic filter frequency compensation. A pulse is generated when the voltage of terminal 13 rises.
30	OUTPUT	PC2	Output terminal for key return signal to let the stereo indicator light up.
31	OUTPUT	PC1	Not used in this unit.
32	OUTPUT	MUTE	Muting signal output terminal. Muting signal is delivered during operation of FM/AM selector switch and tuning switch. (4V during muting)

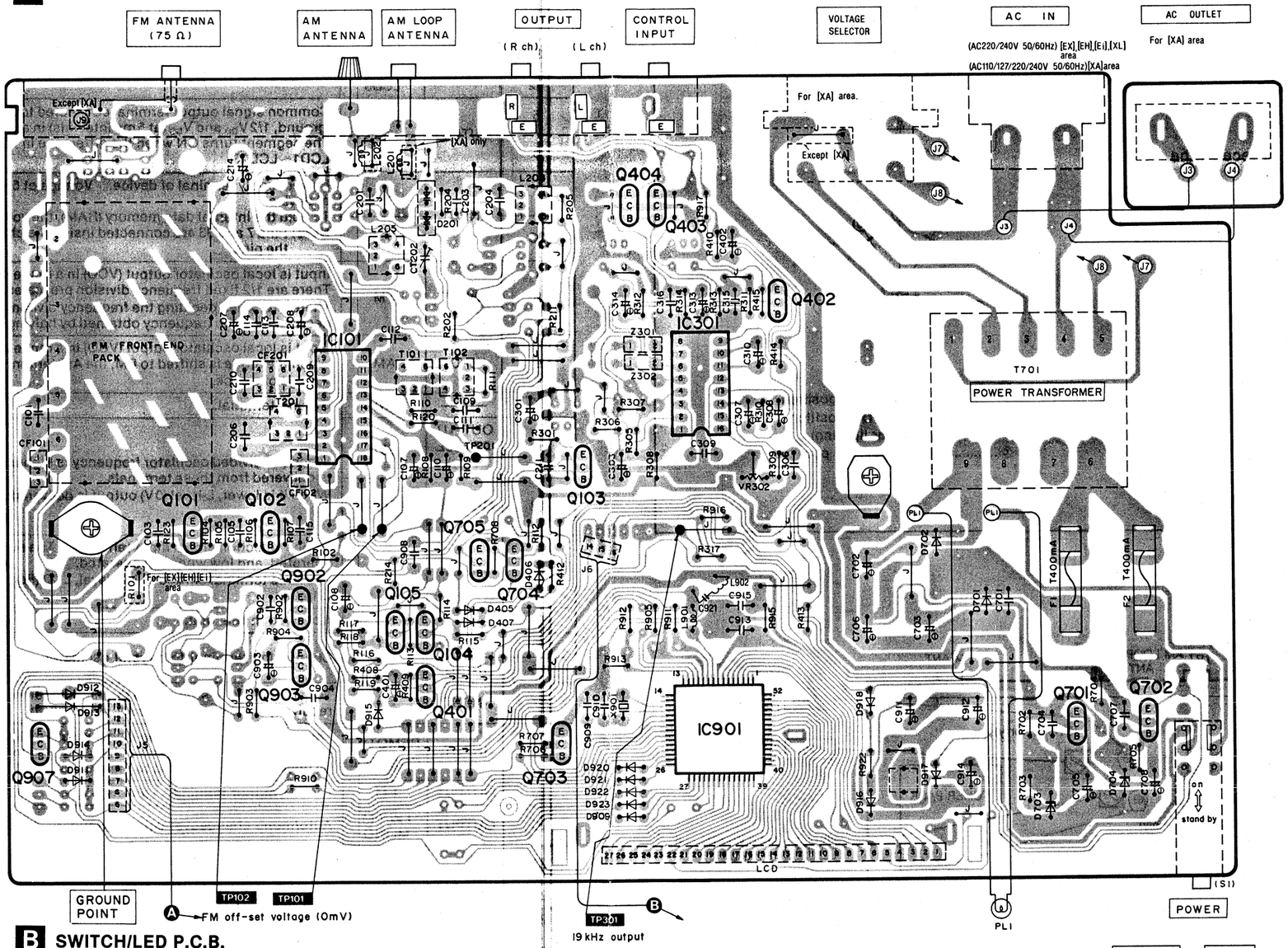
[KEY MATRIX]

Pin No.	25	26	27	28	29
21	UP	AM (MW)	CH5/13	CH1/9	—
22	DOWN	LW	CH6/14	CH2/10	—
23	—	FM	CH7/15	CH3/11	MEMORY
24	—	FM MODE	CH8/16	CH4/12	—

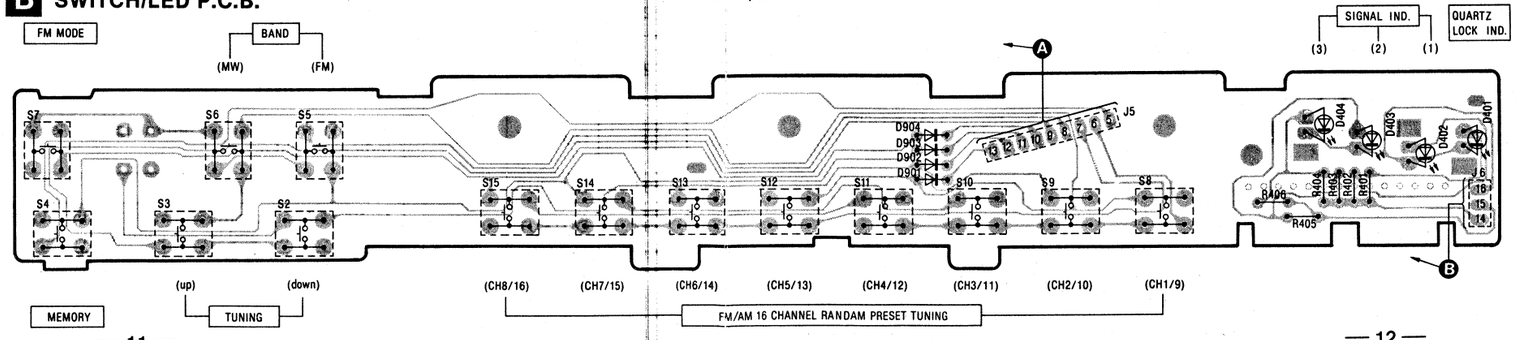
LW: ST-500L only

■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM (ST-500)

A MAIN P.C.B.

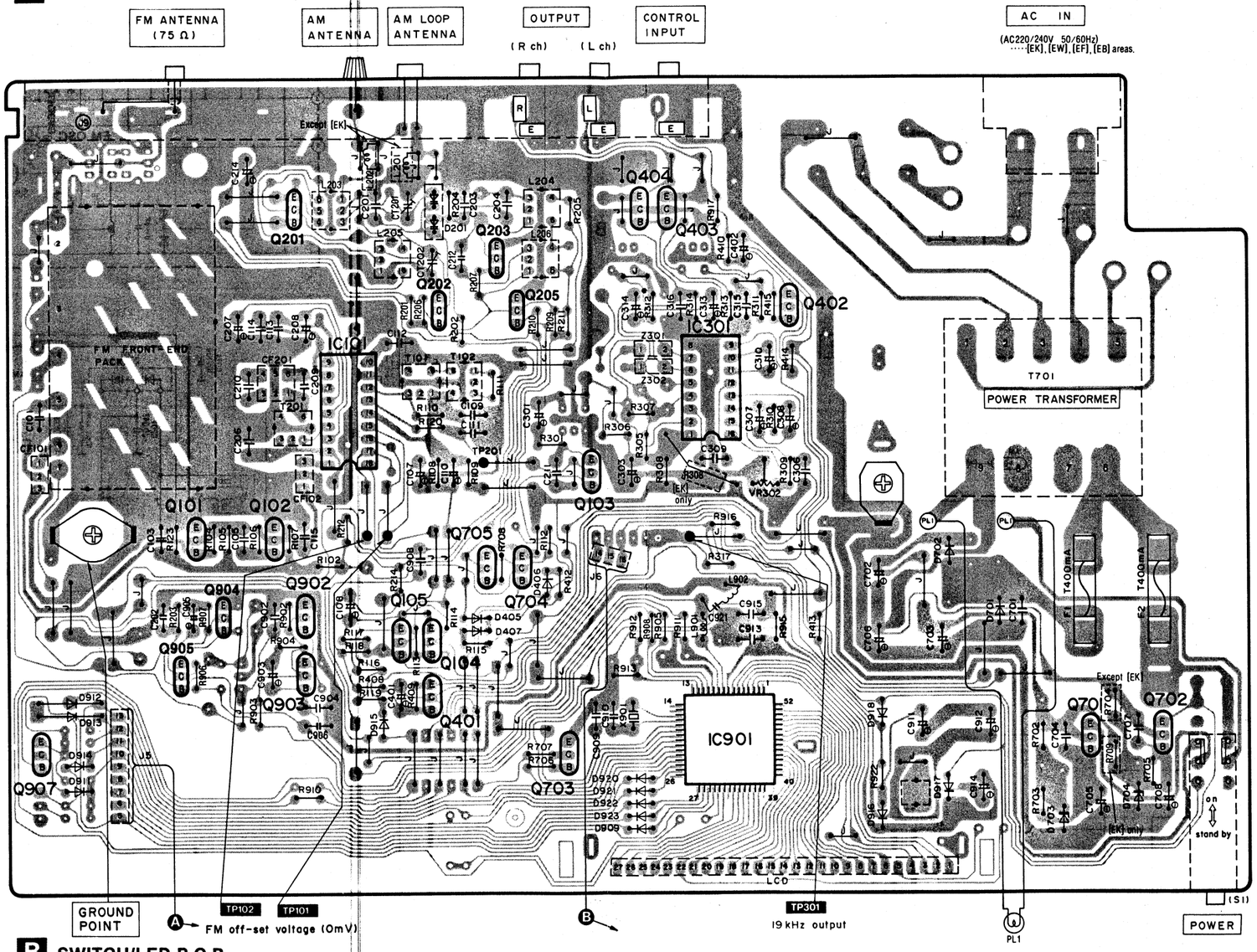


B SWITCH/LED P.C.B.

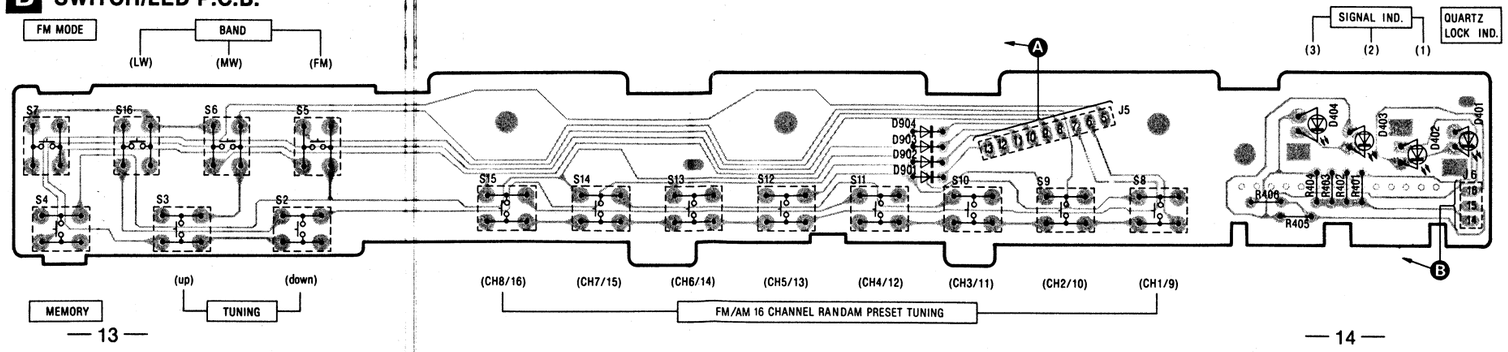


■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM (ST-500L)

A MAIN P.C.B.



B SWITCH/LED P.C.B.



■ RESIS

Notes: • Part r
Pleas
• Impor
Comp
terist
these
parts.

Numbering

Example

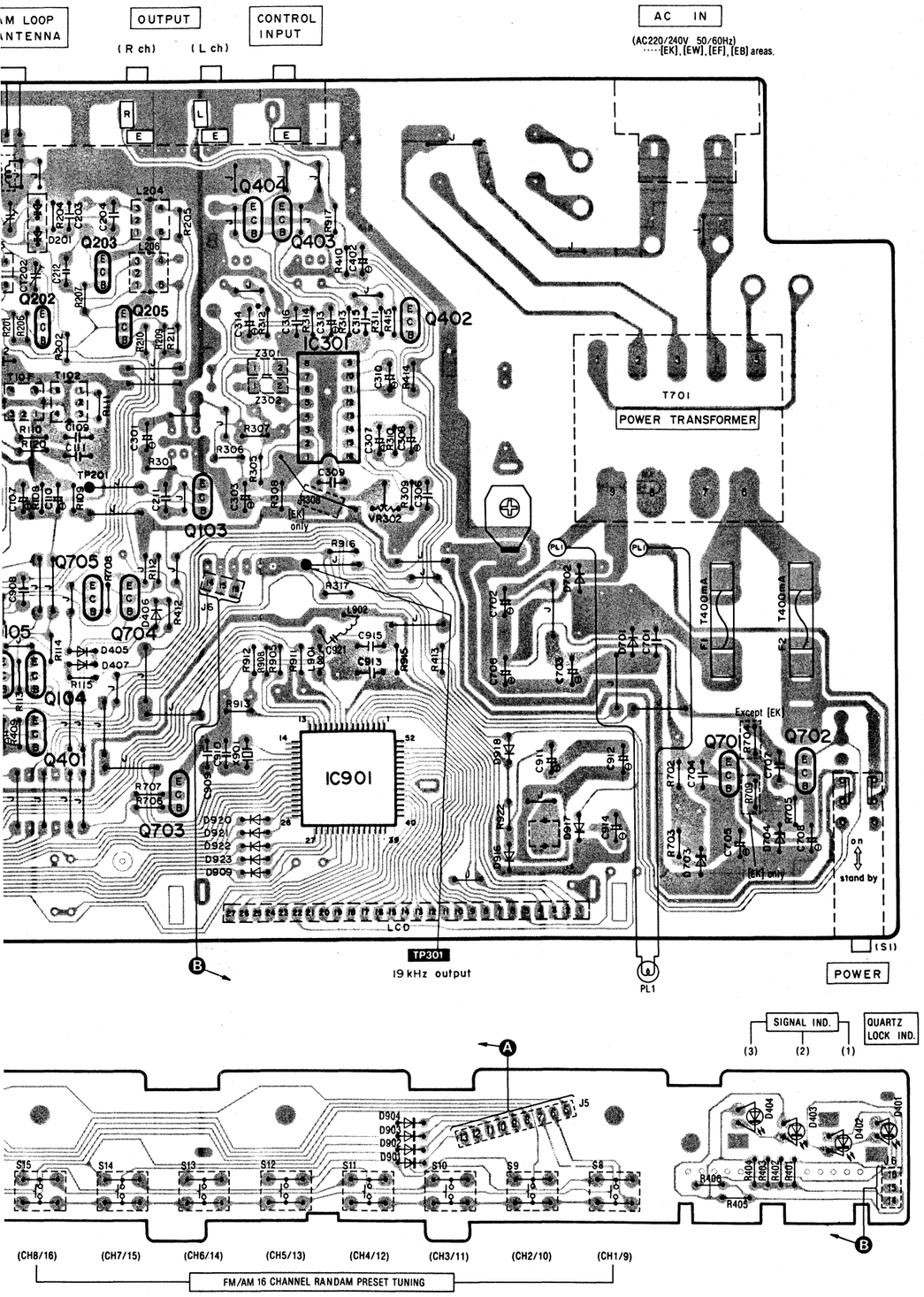
ERD	25
Type	Wattage

Resistor Typ	
ERD	: Carbo
ERC	: Solid
ERO	: Metal

● RESISTOR

Ref. No.	
R102	ERD
R104	ERD
R105	ERD
R106	ERD
R107	ERD
R108	ERD
R109	ERD
R110	ERD
R111	ERD
R112	ERD
R113	ERD
R114	ERD
R115	ERD
R116	ERD
R117	ERD
R118	ERD
R119	ERD
R120	ERD
R123	ERD
R201	ERD
R202	ERD
R203	ERD
R204	ERD
R205	ERD
R206	ERD
R207	ERD
R209	ERD
R210	ERD
R211	ERD
R212	ERD
R214	ERD
R301	ERD
R305, 306	ERD
R307	ERD
R308 [EK] ⚠	ERG
R308 ⚠ [other]	ERD
R309	ERD
R310	ERD
R311, 312	ERD
R313, 314	ERD
R317	ERD
R401, 402	ERD
R403	ERD
R404	ERD
R405	ERD
R406	ERD
R408	ERD
R409	ERD
R410	ERD
R412	ERD
R413	ERD
R414	ERD
R415	ERD
R702	ERD

AM (ST-500L)



■ RESISTORS AND CAPACITORS

Notes:
- Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
- Important safety notice. Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- The unit of resistance is OHM (Ω). K=1000Ω, M=1000kΩ
- The unit of capacitance is MICROFARAD (μF). P=10⁶μF.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type		Wattage		Tolerance	
ERD	: Carbon	25	: 1/4W	F	: ±1%
ERC	: Solid	S2	: 1/4W	J	: ±5%
ERO	: Metal Film	S1	: 1/2W	K	: ±1%
		12	: 1/2W		

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type		Voltage: ECEA Type	Voltage: Other	Tolerance
ECEA	: Electrolytic	0J : 6.3V	1H : 50V DC	C : ±0.25pF
ECCD	: Ceramic	1A : 10V	1 : 125V DC	G : ±2%
ECKD	: Ceramic	1C : 16V	KC : 400V AC	J : ±5%
ECQM	: Polyester	1E : 25V		K : ±10%
ECQP	: Polypropylene	1H : 50V		Z : +80%, −20%
		1V : 35V		
		25 : 25V		

● RESISTORS (ST-500L)

Ref. No.	Part No.	Value
R102	ERDS2TJ122	1.2K
R104	ERDS2TJ474	470K
R105	ERDS2TJ122	1.2K
R106	ERDS2TJ824	820K
R107	ERDS2TJ271	270
R108	ERDS2TJ102	1K
R109	ERDS2TJ471	470
R110	ERDS2TJ822	8.2K
R111	ERDS2TJ222	2.2K
R112	ERDS2TJ104	100K
R113	ERDS2TJ223	22K
R114	ERDS2TJ274	270K
R115	ERDS2TJ563	56K
R116	ERDS2TJ471	470
R117	ERDS2TJ104	100K
R118	ERDS2TJ153	15K
R119	ERDS2TJ822	8.2K
R120	ERDS2TJ561	560
R123	ERDS2TJ182	1.8K
R201	ERDS2TJ103	10K
R202	ERDS2TJ822	8.2K
R203	ERDS2TJ471	470
R204	ERDS2TJ104	100K
R205	ERDS2TJ102	1K
R206	ERDS2TJ182	1.8K
R207	ERDS2TJ223	22K
R209	ERDS2TJ122	1.2K
R210	ERDS2TJ473	47K
R211	ERDS2TJ122	1.2K
R212	ERDS2TJ183	18K
R214	ERDS2TJ474	470K
R301	ERDS2TJ333	33K
R305, 306	ERDS2TJ223	22K
R307	ERDS2TJ274	270K
R308 [EK] ⚠	ERG1ANJ151	150
R308 ⚠ [other]	ERDS2TJ151	150
R309	ERDS2TJ153	15K
R310	ERDS2TJ102	1K
R311, 312	ERDS2TJ332	3.3K
R313, 314	ERDS2TJ104	100K
R317	ERDS2TJ103	10K
R401, 402	ERDS2TJ331	330
R403	ERDS2TJ271	270
R404	ERDS2TJ221	220
R405	ERDS2TJ122	1.2K
R406	ERDS2TJ561	560
R408	ERDS2TJ182	1.8K
R409	ERDS2TJ563	56K
R410	ERDS2TJ222	2.2K
R412	ERDS2TJ123	12K
R413	ERDS2TJ562	5.6K
R414	ERDS2TJ102	1K
R415	ERDS2TJ473	47K
R702	ERDS2TJ102	1K
R703	ERDS2TJ101	100
R704 Except [EK]	ERDS2TJ102	1K
R705	ERDS2TJ101	100
R706	ERDS2TJ104	100K
R707	ERDS2TJ103	10K
R708 [EK] only	ERDS2TJ473	47K
R709 [EK] only	ERDS2TJ152	1.5K
R902	ERDS2TJ562	5.6K
R903	ERDS2TJ103	10K
R904	ERDS2TJ561	560
R905	ERDS2TJ102	1K
R906	ERDS2TJ153	15K
R907	ERDS2TJ332	3.3K
R908	ERDS2TJ102	1K
R910	ERDS2TJ473	47K
R911	ERDS2TJ102	1K
R912	ERDS2TJ123	12K
R913	ERDS2TJ562	5.6K
R915	ERDS2TJ103	10K
R916	ERDS2TJ563	56K
R917	ERDS2TJ102	1K
R922	ERDS2TJ681	680

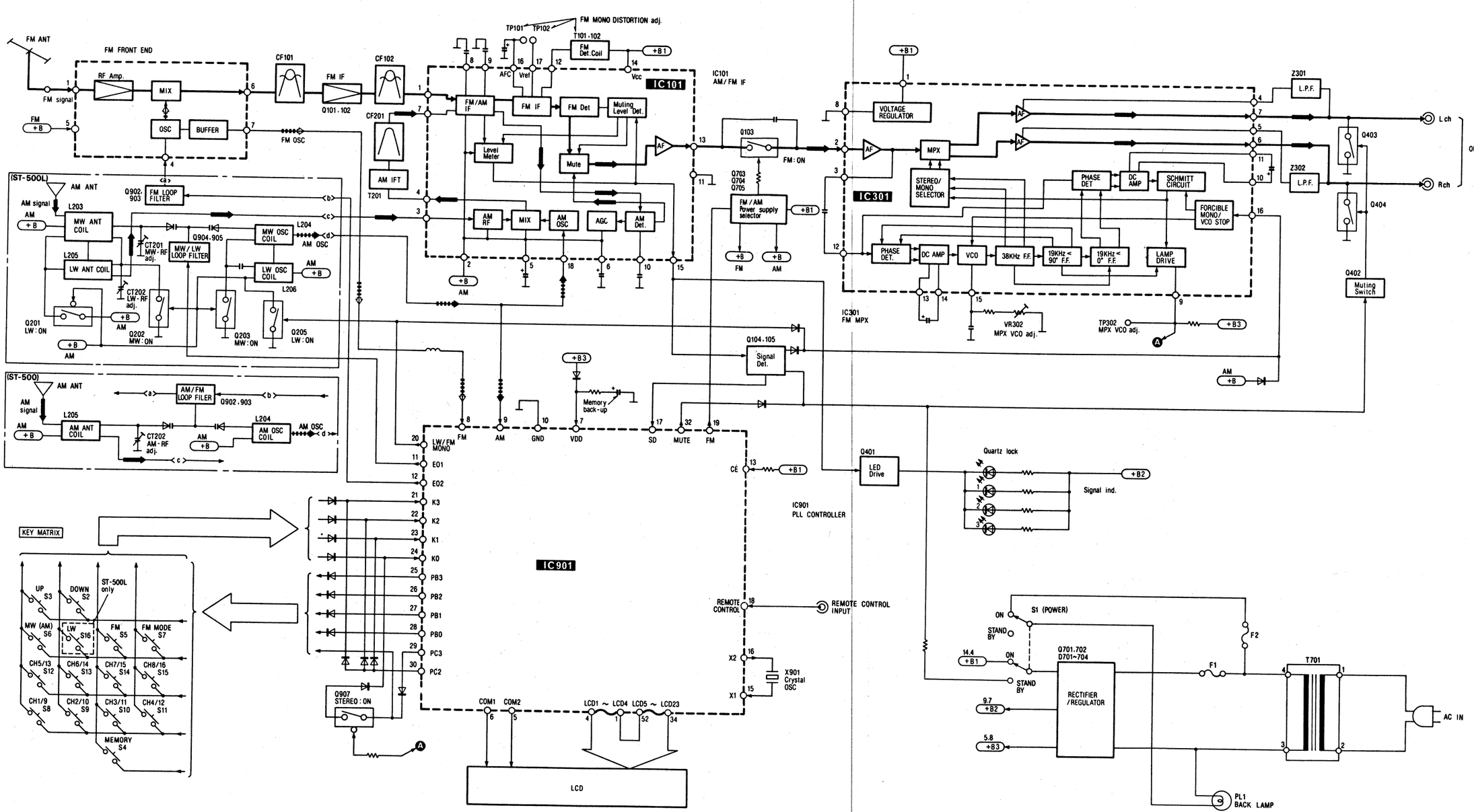
● CAPACITORS (ST-500L)

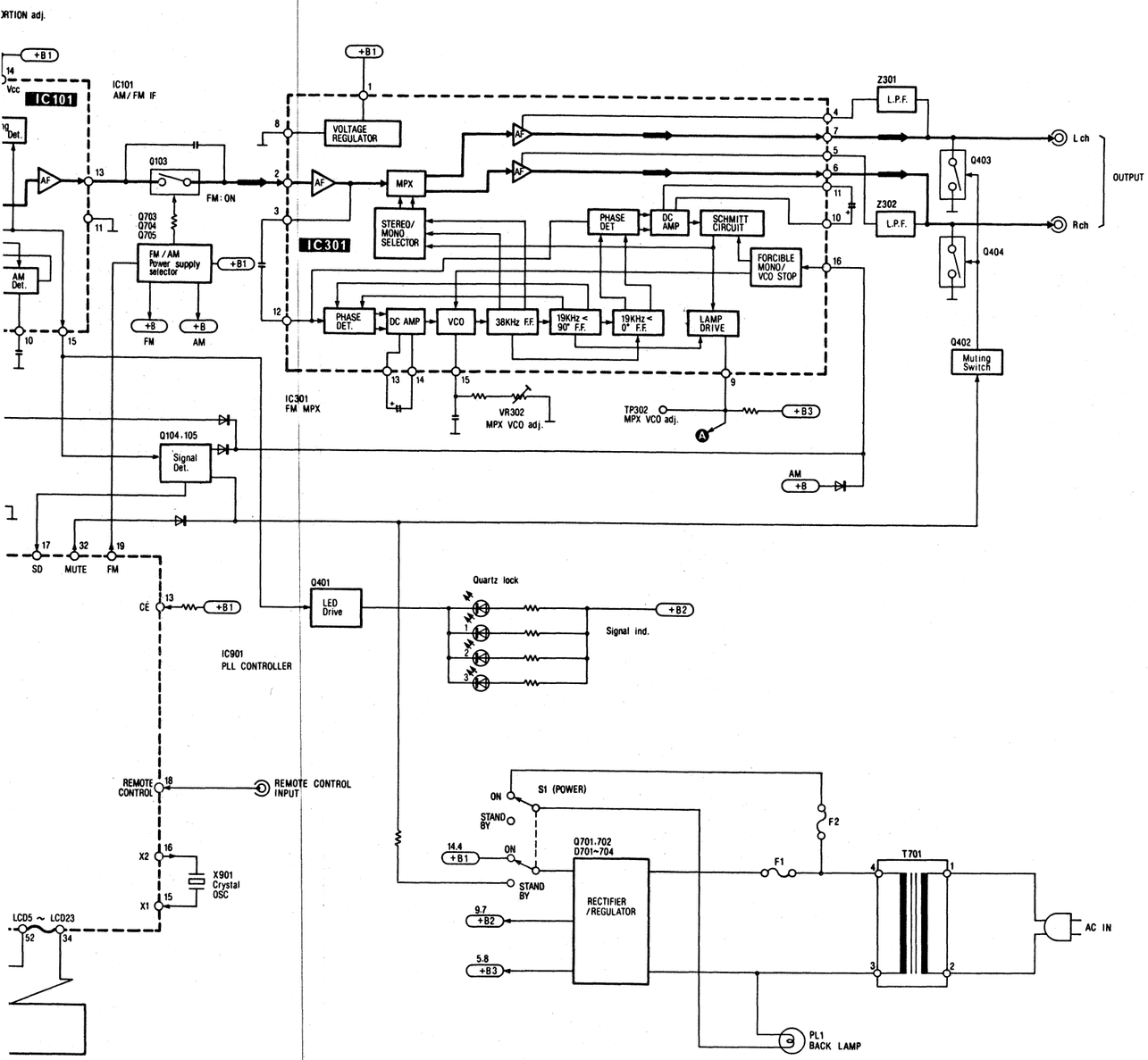
Ref. No.	Part No.	Value
C2	ECKD1H103ZF	0.01
C101	ECKD1H103ZF	0.01
C103	ECKD1H103ZF	0.01
C105	ECCD1H470K	47P
C107	ECEA1HK010	1
C108	ECEA1CU100	10
C109	ECKD1H103ZF	0.01
C110	ECEA1CU100	10
C111	ECCD1H101K	100P
C112, 113	ECKD1H223ZF	0.022
C114	ECKD1H223ZF	0.022
C115	ECCD1H100KC	10P
C201	ECQM1H473JZ	0.047
C202	ECKD1H223ZF	0.022
C203	ECCD1H180KC	18P
C204	ECQP1471JZ	470P
C206	ECKD1H223ZF	0.022
C207	ECEA0JU101	100
C208	ECEA1VU4R7	4.7
C209	ECCD1H080CC	8P
C210	ECCD1H470K	47P
C211	ECFTD153KXL	0.015
C212	ECQP1391JZ	390P
C214	ECEA1AU101	100
C301	ECEA1CU100	10
C303	ECEA1CU101	100
C306	ECQP1471JZ	470P
C307	ECEA1HK010	1
C308	ECEA1HK3R3	3.3
C309	ECKD1H473JZ	0.047
C310	ECEA1HUR47	0.47
C313, 314	ECEA1HUR47	0.47
C315, 316	ECFTD153KXL	0.015
C401	ECEA1HK3R3	3.3
C402	ECEA1CU100	10
C701	ECKD2H102ZF	0.001
C702	ECEA1EU471	470
C703	ECEA1VU471	470
C704	ECKD1H103ZF	0.01
C705	ECEA1CU331	330
C706	ECEA1CU222	2200
C707	ECKD1H103ZF	0.01
C708	ECEA1CU101	100
C902	ECKD1H223ZF	0.022
C903	ECEA25M4R7R	4.7
C904	ECKD1H103ZF	0.01
C905	ECEA1HK010	1
C906	ECKD1H223ZF	0.022
C908, 909	ECCD1H470K	47P
C910	ECCD1H100KC	10P
C911, 912	EECW2R3A3R3E	3.3F
C913	ECKD1H103ZF	0.01
C914	ECEA0JU102	1000
C915	ECKD1H103ZF	0.01
C920	ECCD1H100KC	10P
C921	ECCD1H181K	180P

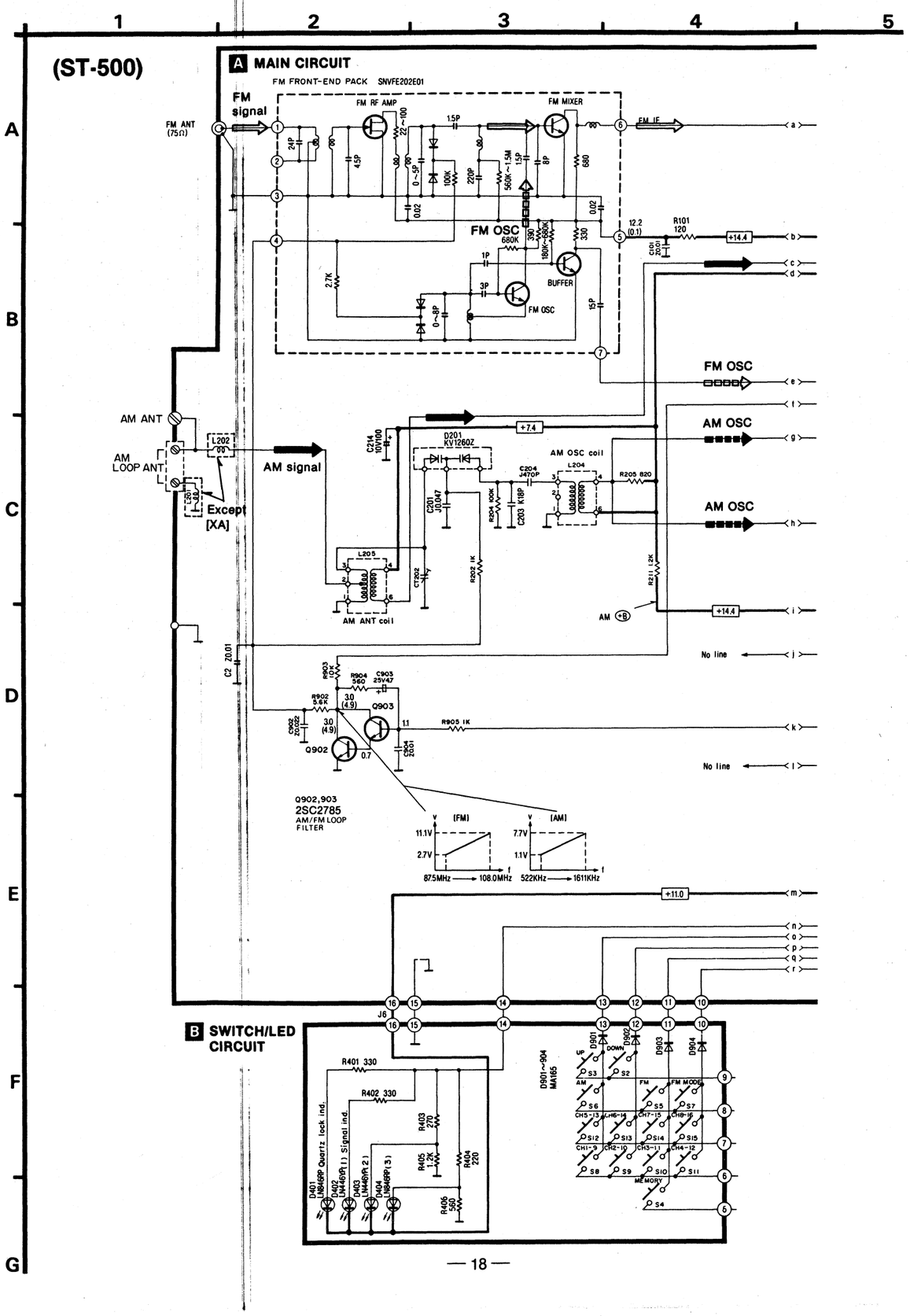
● Change of Parts List (ST-500 from ST-500L)

Ref. No.	Change of Part No.: ST-500L [EK] →	ST-500 [EX, EH, XA, XL, EI]	Description
RESISTORS			
R101	———	ERDS2TJ121	(Addition) [EX, EH, EI] 120Ω
R201	ERDS2TJ103	———	(Deletion)
R202	ERDS2TJ822	ERDS2TJ102	1kΩ
R203	ERDS2TJ471	———	(Deletion)
R205	ERDS2TJ102	ERDS2TJ821	820Ω
R206	ERDS2TJ182	———	(Deletion)
R207	ERDS2TJ223	———	(Deletion)
R209	ERDS2TJ122	———	(Deletion)
R210	ERDS2TJ473	———	(Deletion)
R212	ERDS2TJ183	———	(Deletion)
R308	ERG1ANJ151	ERDS2TJ151	150Ω
R704	———	ERDS2TJ102	(Addition) 1kΩ
R709	ERDS2TJ152	———	(Deletion)
R906	ERDS2TJ153	———	(Deletion)
R907	ERDS2TJ332	———	(Deletion)
R908	ERDS2TJ102	———	(Deletion)
CAPACITORS			
C202	ECKD1H223ZF	———	(Deletion)
C212	ECQP1391JZ	———	(Deletion)
C905	ECEA1HK010	———	(Deletion)
C906	ECKD1H223ZF	———	(Deletion)
C920	ECCD1H100KC	———	(Deletion)

■ BLOCK DIAGRAM




ORTION adj.
IC101
AM/FM IF
IC 101
VOLTAGE REGULATOR
Q103
FM : ON
Q703
Q704
Q705
FM / AM Power supply selector
+B1
+8 FM
+8 AM
MPX
STEREO/ MONO SELECTOR
IC301
PHASE DET
DC AMP
SCHMITT CIRCUIT
FORCIBLE MONO/ VCO STOP
PHASE DET.
DC AMP
VCO
38KHz F.F.
19KHz < 90° F.F.
19KHz < 0° F.F.
LAMP DRIVE
IC301
FM MPX
VR302
MPX VCO adj.
TP302
MPX VCO adj.
+B3
Z301
L.P.F.
Z302
L.P.F.
Q403
Q404
Q402
Muting Switch
L ch
R ch
OUTPUT
Q104.105
Signal Det.
AM
+8
SD
MUTE
FM
CE
Q401
LED Drive
Quartz lock
+B2
Signal ind.
IC901
PLL CONTROLLER
REMOTE CONTROL
REMOTE CONTROL INPUT
X2
X1
X901
Crystal OSC
LCD5 ~ LCD23
S1 (POWER)
ON
STAND BY
14.4
+B1
Q701·702
Q701~704
RECTIFIER /REGULATOR
9.7
+B2
5.8
+B3
F1
F2
T701
AC IN
PL1
BACK LAMP


1
2
3
4
5
A
B
C
D
E
F
G
(ST-500)
A MAIN CIRCUIT
FM FRONT-END PACK SNVFE202E01
FM signal
FM ANT (75Ω)
FM RF AMP
FM MIXER
FM IF
FM OSC
BUFFER
FM OSC
AM ANT
AM LOOP ANT
AM signal
Except [XA]
AM OSC coil
AM ANT coil
AM OSC
AM OSC
AM OSC
AM (+B)
No line
No line
Q902,903
2SC2785
AM/FM LOOP FILTER
(FM)
(AM)
11.1V
2.7V
7.7V
1.1V
87.5MHz → 108.0MHz
522KHz → 1611KHz
B SWITCH/LED CIRCUIT
D901~904
MA165
R401 330
R402 330
R403 270
R405 1.2K
R404 220
R406 560
D401 LN1469P Quartz lock ind.
D402 LN1469PA (1) Signal ind.
D403 LN1469PA (2)
D404 LN1469PA (3)
UP
DOWN
AM
FM
FM MODE
MEMORY

(ST-500L)

A MAIN CIRCUIT

FM FRONT-END PACK SNVFE202E01

FM signal

FM RF AMP

FM MIXER

FM IF

FM OSC

BUFFER

FM OSC

FM ANT (75Ω)

IC101 AN7273A FM IF DET. & AM CON

Q101, 102 2SC2787L FM IF AMP

Q103 2SC3311 SWITCHING

Q703 2SC3311 SWITCHING

Q704, 705 2SA1309A SWITCHING

FM off-set voltage (0mV)

TP102

TP201

IC301 AN7470 FM MPX

MPX VCO adj.

19kHz output

FM MONO DISTORTION adj.

Q401 2SC1685 SIGNAL IND. DRIVE

Q104, 105 2SC3311 SIGNAL IND. DRIVE

FM AF signal (Lch)

FM AF signal (Rch)

Q403, 404 2SC3311 MUTING CONTROL

OUTPUT

Lch

Rch

REMOTE CONTROL INPUT

Q402 2SA1309A MUTING SWITCH

S1 (POWER)

stand by

Q701 2SC1384 REGULATOR

Q702 2SC3311 REGULATOR

Except [EK]

[EK] only

2SC1384 : [EK] only

AC220V (50/60Hz) [EX], [EF], [EB], [EH] [EW], [EI] AC240V (50/60Hz) [EK], [XL]

MW ANT trimmer

AM signal

AM OSC

EXT AM ANT

AM LOOP ANT

Except [EK]

Q201 2SA1309A MW/LW SWITCHING

MW ANT coil

LW ANT coil

LW OSC coil

LW ANT trimmer

Q202, 203 2SC2785 MW/LW SWITCHING

Q205 2SC3311 MW/LW SELECTOR

Q902, 903 2SC2785 FM LOOP FILTER

Q904, 905 2SA1309Q MW/LW LOOP FILTER

Memory back-up

Crystall oscillator (4.5MHz)

IC901 μPD1718G514 PLL CONTROLLER

REMOTE CONTROL

"H" with forcible monaural mode

LCD SEGMENT

Liquid Crystal Display (LCD)

(ST-500only)

IC901 28 pin

AM memo COM1 COM2

PL1 LCD BACK LAMP

B SWITCH/LED CIRCUIT

D901~904 MA165

D401 HM480P Quartz lock ind.

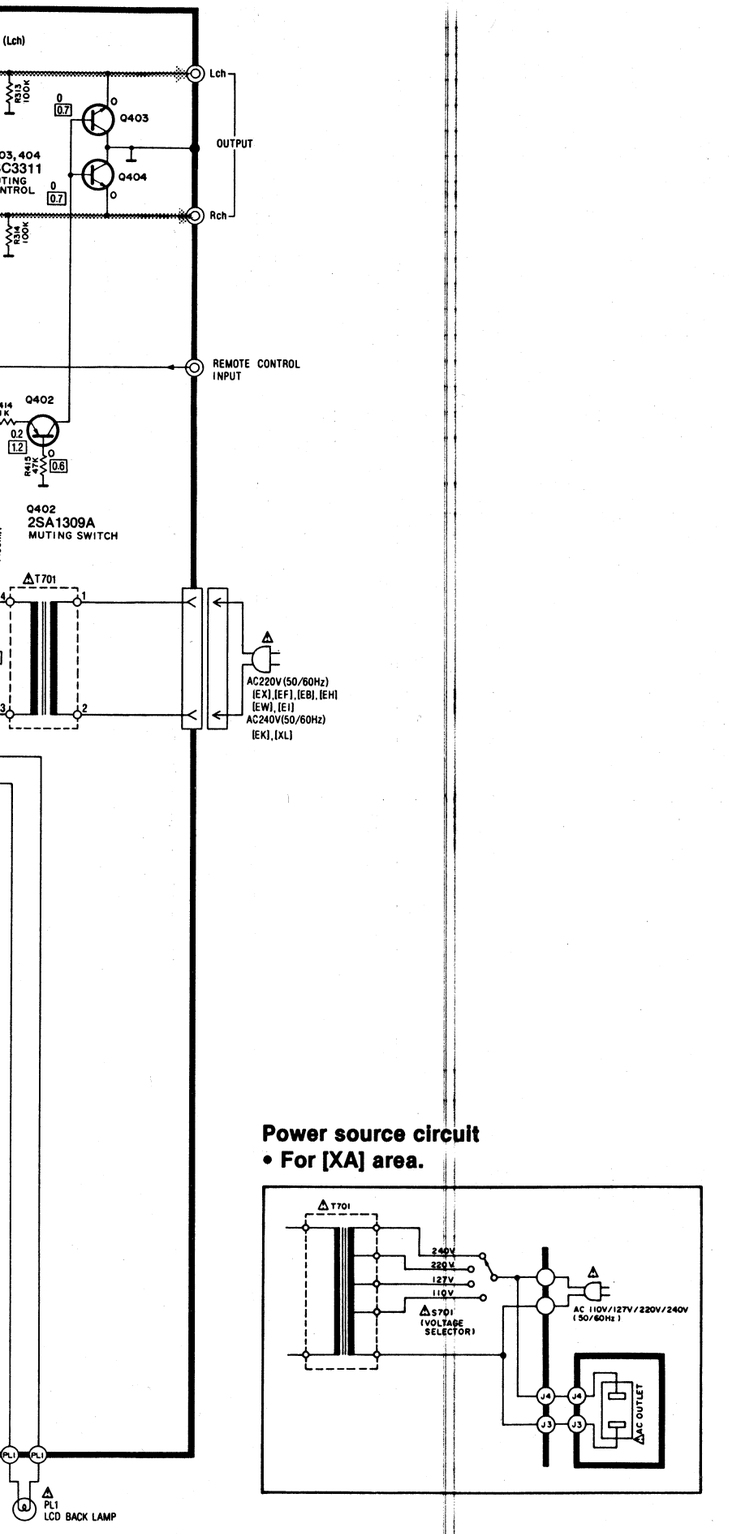
D402 LN46GR(1) Signal ind.

D403 LN46GR(2)

D404 LN46GR(3)

Q907 2SA1309A SWITCHING

Power sou
• For [XA]



Power source circuit

- **For [XA] area.**

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Note 1:

- **S1** : Power switch in "on" position.
- **S2** : Tuning (down) switch.
  [down: tuning to lower frequency]
- **S3** : Tuning (up) switch.
  [up: tuning to higher frequency]
- **S4** : Memory set switch. (manual ↔ auto memory)
- **S5** : FM select switch.
- **S6** : AM select switch.
- **S7** : FM mode switch. (stereo ↔ mono)
- **S8~S15** : Preset tuning switch.
  * With it momentarily pushed (less than 0.4 sec.) and released, the 1~8 CH are received.
  * With it continuously pushed (0.4 sec. or more) and released, the 9~16 CH are received.
- **S16 (ST-500L only):** LW select switch.
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
  All voltage values shown in circuitry are DC voltage in FM signal (no signal) reception modes.
  * Figures in ◄ ► stand for DC voltage in FM stereo signal reception mode.
  * Figures in ( ) stand for DC voltage in AM signal reception mode.
  * Figures in ⌈ ⌋ stand for DC voltage in LW signal reception mode.
  * Figures in ▭ stand for muting mode.

——— Positive voltage lines
▭▭▭▷ FM OSC
■■■■▶ AM OSC
▒▒▒▒ AF signal lines
═══▷ FM signal
━━━▶ AM signal

- Important safety notice.
  Components identified by ⚠ mark have special characteristics important for safety.
  When replacing any of these components, use only manufacturer's specified parts.

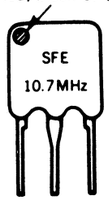
Part No.	Original Part No.	Supply Part No.
IC301 D912, 913	AN7470 MA150	SVIUPC1161C3 MA162A

Note 2:

- **Use of ceramic filters in pairs**

The ceramic filters (CF101, CF102) for FM-IF circuit are available in three versions. For this circuit, be sure to use the ceramics of the same version in a pair.
At repairing and replacement, pay close attention to the diodes (D912, D913) for use as different diodes must be used depending on each version of the ceramic filters.

Color marking
(Red, Black or White)



VERSION (Color)	D912	D913	CENTER FREQUENCY
Black	○	×	10.65MHz
Red	×	×	10.70MHz
White	×	○	10.75MHz

Note: ○ mark: Diode is used.
× mark: Diode is not used.

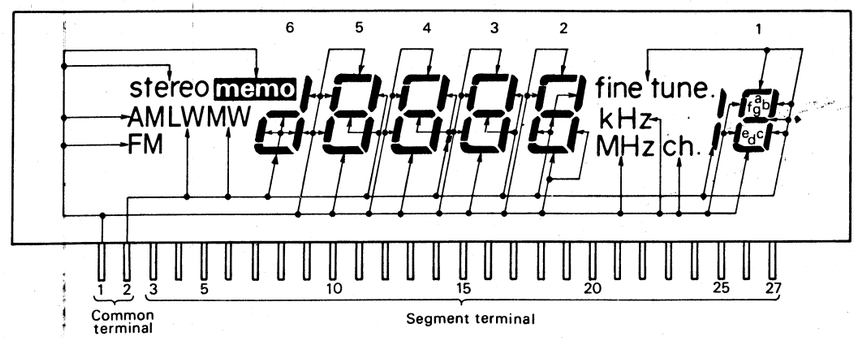
∗ Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

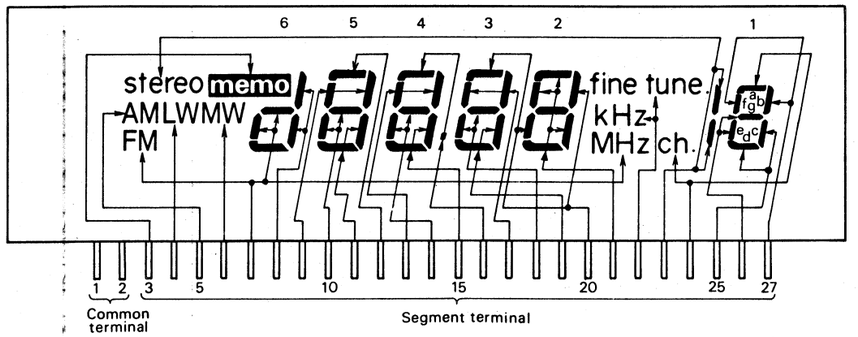
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

■ DESCRIPTION OF LCD PANEL

- **COMMON**



- **SEGMENT**

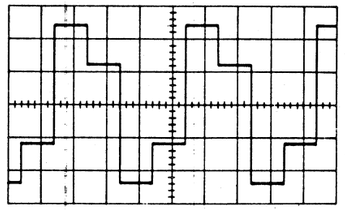


No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
COM1	COM1	—	MEMO	—	AM	—	FM, MHz	6b	5f	5e	5d	5a	4f	4e	4d
COM2	—	COM2	—	LW	—	MW	6deg	6c	5b	5g	5c	—	4b	4g	4c

No.	16	17	18	19	20	21	22	23	24	25	26	27
COM1	4a	3f	3e	3d	3a	2acdf	kHz	stereo	ch	1d	1e	1f
COM2	▰	3b	3g	3c	2be	2g	fine tune	▰	1a	1c	1g	1b

< Segment ON >

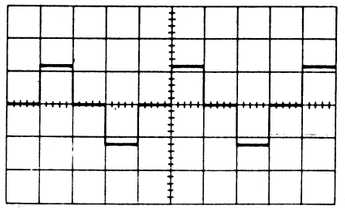
Pin ① or ② of LCD and each segment terminal.



2V AC/DIV, 5m sec/cm

< Segment OFF >

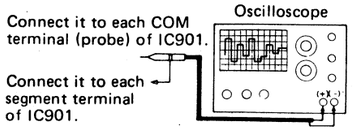
Pin ① or ② of LCD and each segment terminal.



2V AC/DIV, 5m sec/cm

- **Each segment waveform measuring method**

Note: Potential difference from COM terminal waveform is measured for each segment output waveform.
Do not ground with other equipment on the oscilloscope or IC901 will fail.



■ REPLACEMENT PARTS LIST

Notes:
- Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
- The parenthesized numbers in the column of description stand for the quantity per set.

● Change of Parts List (ST-500 from ST-500L)

Ref. No.	Change of Part No. ST-500L [EK] → ST-500 [EX, EH, XA, XL, EI]		Part Name & Description	Pcs/Set	Remarks
TRANSISTORS					
Q201	2SA1309Q	———	———	—	(Deletion)
Q202, 203	2SC2785F	———	———	—	(Deletion)
Q205, 904 905	2SC3311−Q	———	———	—	(Deletion)
Q702	2SC1384A−R	2SC3311−Q	Transistor	(1)	
COILS					
L201, 202	———	ELEPK1R0MA	Except [XA] Choke, 1μH	(1)	(Addition)
L203	SLA2B3−P	———	———	—	(Deletion)
L204	SLO2B9R−P	SLO2B7−M	AM OSC	(1)	
L205	SLA1B7R−P	SLA2B1−1M	AM Antenna	(1)	
L206	SLO1B5−P	———	———	—	(Deletion)
TRANSFORMERS					
T701	SLT5K201−S	SLT5K203−S	[XA] Power Source	(1)	⚠
		SLT5K201−S	[XL] Power Source	(1)	⚠
		SLT5K199−S	[other] Power Source	(1)	⚠
VARIABLE CAPACITORS					
CT201	ECRHA010A41	———	———	—	(Deletion)
CT202	ECRHA020D41	ECRHA010A41	AM Antenna	(1)	
FUSES					
F1, 2	XBA2C04TB0	XBA2C04TR0	250V, T400mA	(2)	⚠
SWITCHES					
S16	SSG13	———	———	—	(Deletion)
S701	———	SSR187−1	[XA] only Voltage Selector	(1)	⚠ (Addition)
CABINET and CHASSIS PARTS					
1	SGYT500L−SE	SGYT500−SE	Front Panel Ass'y	(1)	
1	SGYT500L−KE	SGYT500−KE	Front Panel Ass'y	(1)	
3	SBC816	SBCTZ990−KM	Selector Button Ass'y	(1)	
3	SBC816−1	SBCTS75−KM	Selector Button Ass'y	(1)	
11	SJF8612N	SJF8714N	[XA, XL] Terminal Board	(1)	
		SJF8612N	[other] Terminal Board	(1)	
12	———	SUS803	[EK, EH] only Spring, Ground	(1)	(Addition)
13	SGPT500L−SK	SGPT500−SX	[EX] Rear Panel Ass'y	(1)	
		SGPT500−SH	[EH] Rear Panel Ass'y	(1)	
		SGPT500−SL	[XL] Rear Panel Ass'y	(1)	
		SGPT500−SJ	[EI] Rear Panel Ass'y	(1)	
		SGPT500−SA	[XA] Rear Panel Ass'y	(1)	
17	———	SJS9232B	[XA] only AC Outlet	(1)	⚠ (Addition)
19	SJT347	———	———	—	(Deletion)
21	———	SMX887	[XA] only Insuration Cover	(1)	(Addition)
23	———	SJS9232A	[XA] only AC Outlet Cover	(1)	(Addition)
24	SJT30343−V	SJS5327	Socket (3P) (J6)	(1)	
24	SJT30943−V	SJS5903	Socket (9P) (J5)	(1)	
ACCESSORIES					
A1	SQF12762	SQF12756	[EX, EH] Instruction Book	(1)	
		SQF12757	[EI] Instruction Book	(1)	
		SQF12758	[XA] Instruction Book	(1)	
		SQF12760	[XL] Instruction Book	(1)	

Ref. No.	Change of Part No. ST-500L [EK] → ST-500 [EX, EH, XA, XL, EI]		Part Name & Description	Pcs/Set	Remarks
A2	SFDAC05G02	SJA163	[XL] AC Cord	(1)	⚠
		SJA168−1	[XA] AC Cord	(1)	⚠
		SJA171	[other] AC Cord	(1)	⚠
A4	SSA270M	SSA269M	[XA, XL] FM Antenna Cord	(1)	
		SSA270M	[other] FM Antenna Cord	(1)	
A6	SJP9009	SJP9215	[XA] Plug	(1)	⚠
		———	[other] ———	—	(Deletion)
PACKING PARTS					
P1	SPG5662	SPG5665	[XL] Carton Box	(1)	
		SPG5668	[EI] Carton Box	(1)	
		SPG5664	○ [other] Carton Box	(1)	
		SPG5663	Ⓚ [other] Carton Box	(1)	
P2	SPS4588	SPS4588−1	[XL] Pad, Left Side	(1)	
		SPS4588	[other] Pad, Left Side	(1)	
P3	SPS4589	SPS4589−1	[XL] Pad, Right Side	(1)	
		SPS4589	[other] Pad, Right Side	(1)	

● ST-500L [EK, EB, EF, EW]

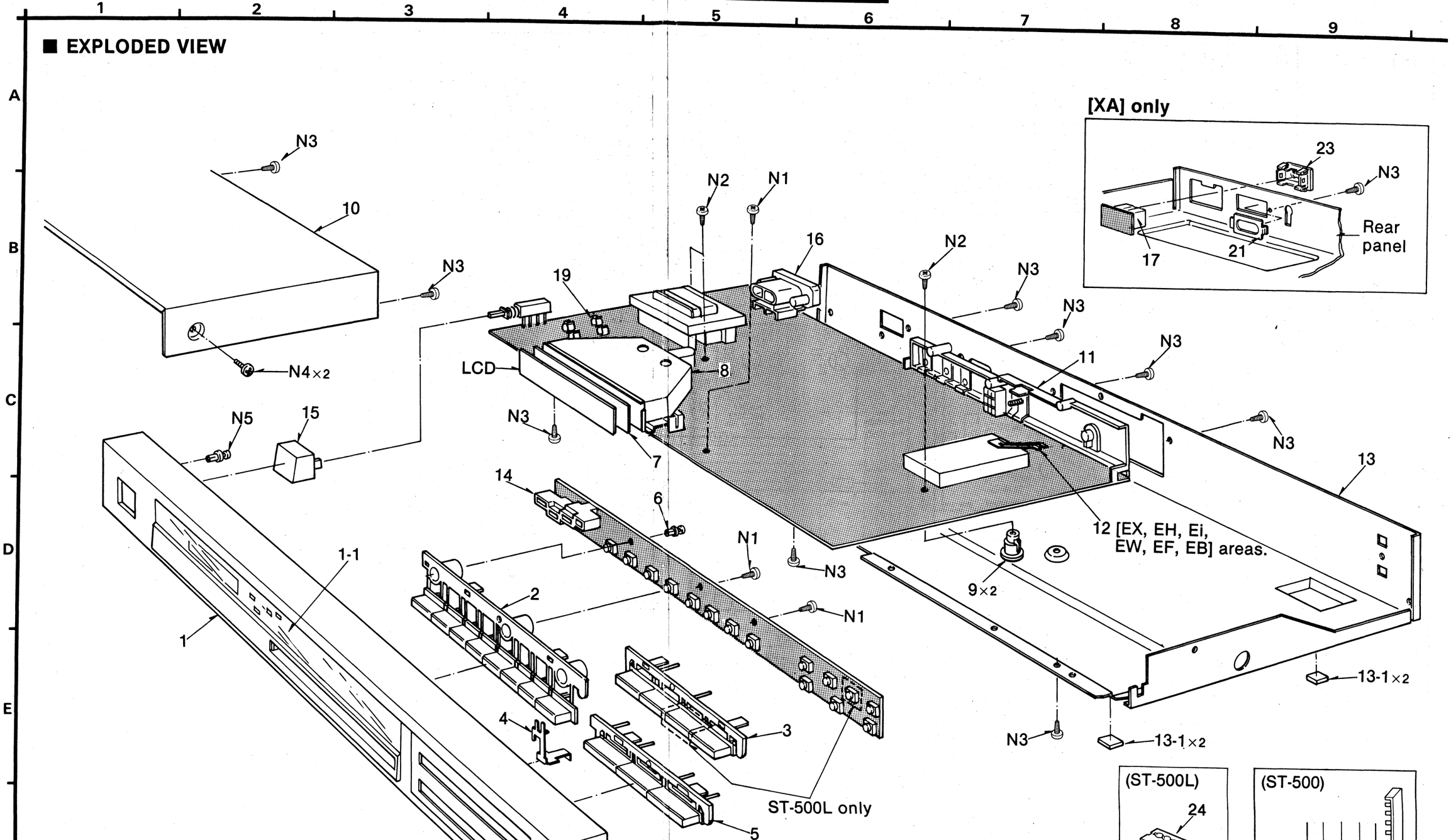
Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	AN7273A	Integrated Circuit
IC301	SVIUPC1161C3	Integrated Circuit
IC901	UPD1708G571	Integrated Circuit
TRANSISTORS		
Q101, 102	2SC2787L	Transistor
Q103～105, 205, 403, 404, 703, 904, 905	2SC3311−Q	Transistor
Q201, 402, 704, 705, 907	2SA1309Q	Transistor
Q202, 203, 902, 903	2SC2785F	Transistor
Q401	2SC1685−S	Transistor
Q701	2SC1384A−R	Transistor
Q702 [EK]	2SC1384A−R	Transistor
Q702 [other]	2SC3311−Q	Transistor
DIODES		
D201	KV1260Z	Diode
D401	LN846RP	L.E.D.
D402～404	LN446YP	L.E.D.
D405～407, 901～904, 909, 911, 914～918, 920～923	MA165	Diode
D701, 702 ⚠	1SR35200	Rectifier
D703	MA4150M	Diode
D704	MA4062−M	Diode
D912, 913	MA162A	Diode
COILS		
L201, 202 Except [EK]	ELEPKR22MA	Choke, 0.22μH
L203	SLA2B3−P	MW Antenna
L204	SLO2B9R−P	MW OSC
L205	SLA1B7R−P	LW Antenna
L206	SLO1B5−P	LW OSC
L901	ELEPKR22MA	Choke, 0.22μH
L902	ELEPK1R2MA	Choke, 1.2μH
TRANSFORMERS		
T101	SLI4B511−Z	FM IFT
T102	SLI4B513−Z	FM IFT
T201	SLI2B101−M	AM IFT
T701 [EK] ⚠	SLT5K201−S	Power Source
T701 [other] ⚠	SLT5K199−S	Power Source
CERAMIC FILTERS		
CF101, 102	SVFE107MS2−A	FM, 10.7MHz (Red)
	SVFE107MS2−D	FM, 10.65MHz (Black)
	SVFE107MS2−E	FM, 10.75MHz (White)

Ref. No.	Part No.	Description
CF201	SVFSFZ450F7L	AM, 450kHz
CRYSTAL		
X901	SVQ49U452−T	4.5MHz, Counter OSC
VARIABLE RESISTOR		
VR302	QVNB3A00B472	FM MPX VCO Adj.
VARIABLE CAPACITORS		
CT201	ECRHA010A41	Trimmer
CT202	ECRHA020D41	Trimmer
COMPONENT COMBINATIONS		
Z301, 302	EXRP181K473C	180pF, 47kΩ
LIQUID CRYSTAL DISPLAY		
LCD	SALHLC9225−6	
FM FRONT END		
	SNVFE202E01	FM Front End Pack
LAMP		
PL1 ⚠	XAMS15S150	9.6V, 0.27A
FUSES		
F1, 2 [EK] ⚠	XBA2C04TB0	250V, 400mA
F1, 2 [other] ⚠	XBA2C04TR0	250V, 400mA
SWITCHES		
S1 ⚠	SSH1196	Power Source Preset, Band Selector, FM Mode Tuning, Memory
S2～16	SSG13	

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1 ○	SGYT500L−SE	Front Panel Ass'y (1)
1 Ⓚ	SGYT500L−KE	Front Panel Ass'y (1)
(1-1	(SDU293F	Transparent Plate (1)
2 ○	SBC814	Preset Button (1)
2 Ⓚ	SBC814−1	Preset Button (1)
3 ○	SBC816	Selector Button (1)
3 Ⓚ	SBC816−1	Selector Button (1)
4	SUS793	Spring (Silver Type Only) (1)
5 ○	SBC815	Tuning Button (1)
5 Ⓚ	SBC815−1	Tuning Button (1)
6	SHR415	Nylon Pin (1)
7	SDU296A	Filter (1)
8	SMP409	Lamp Case (1)
9	SHE170−1	Spacer (2)
10 ○	SKCTZ450L−SE	Cabinet Ass'y (1)
10 Ⓚ	SKCTZ450L−KE	Cabinet Ass'y (1)
11	SJF8612N	Terminal Board (1)
12 Except [EK]	SUS803	Spring, Ground (1)
13 [EW]	SGPT500L−SW	Rear Panel Ass'y (1)
13 [EB]	SGPT500L−SB	Rear Panel Ass'y (1)
13 [EK]	SGPT500L−SK	Rear Panel Ass'y (1)
13 [EF]	SGPT500L−SF	Rear Panel Ass'y (1) (MELUK)
(13-1	(SKL297−1	Foot (4)
14	LN041325P2	L.E.D. Ass'y (1)
15 ○	SBC666	Power Button (1)
15 Ⓚ	SBC666−3	Power Button (1)
16 ⚠	SJS9230−1	AC Inlet (1)
19	SJT347	Fuse Holder (2)
24	SJT30343−V	Connector (3P) (J6) (1)
24	SJT30943−V	Connector (9P) (J5) (1)
SCREWS		
N1	XTB3+8G	Tapping, ⊕3×8 (3)
N2	XTBS3+12F1	Tapping, ⊕3×12 (2)
N3	XTBS3+8JFZ1	Tapping, ⊕3×8 (9)
N4 ○	SNE2095−4	Cabinet (2)
N4 Ⓚ	SNE2095−5	Cabinet (2)
N5	XTWS3+10Q	Tapping, ⊕3×10 (1)
ACCESSORIES		
A1 [EK]	SQF12762	Instruction Book (1)
A1 [EF]	SQF12763	Instruction Book (1) (MELUK)
A1 [EW, EB]	SQF12756	Instruction Book (1)
A2 [EK] ⚠	SFDAC05G02	AC Cord (1)
A2 ⚠ [other]	SJA171	AC Cord (1)
A3	SJP2269	Pin Cord (1)
A4	SSA270M	FM Antenna Cord (1)
A5	SPB1139	Loop Antenna (1)
A6 ⚠ [EK] only	SJP9009	Plug (1)

Ref. No.	Part No.
PACKING PARTS	
P1 [EK] ○	SPG5662
P1 [EK] Ⓚ	SPG5669
P1 ○ [EW, EB]	SPG5666
P1 Ⓚ [EW, EB]	SPG5667
P1 [EF]	SPG5670

■ EXPLODED VIEW



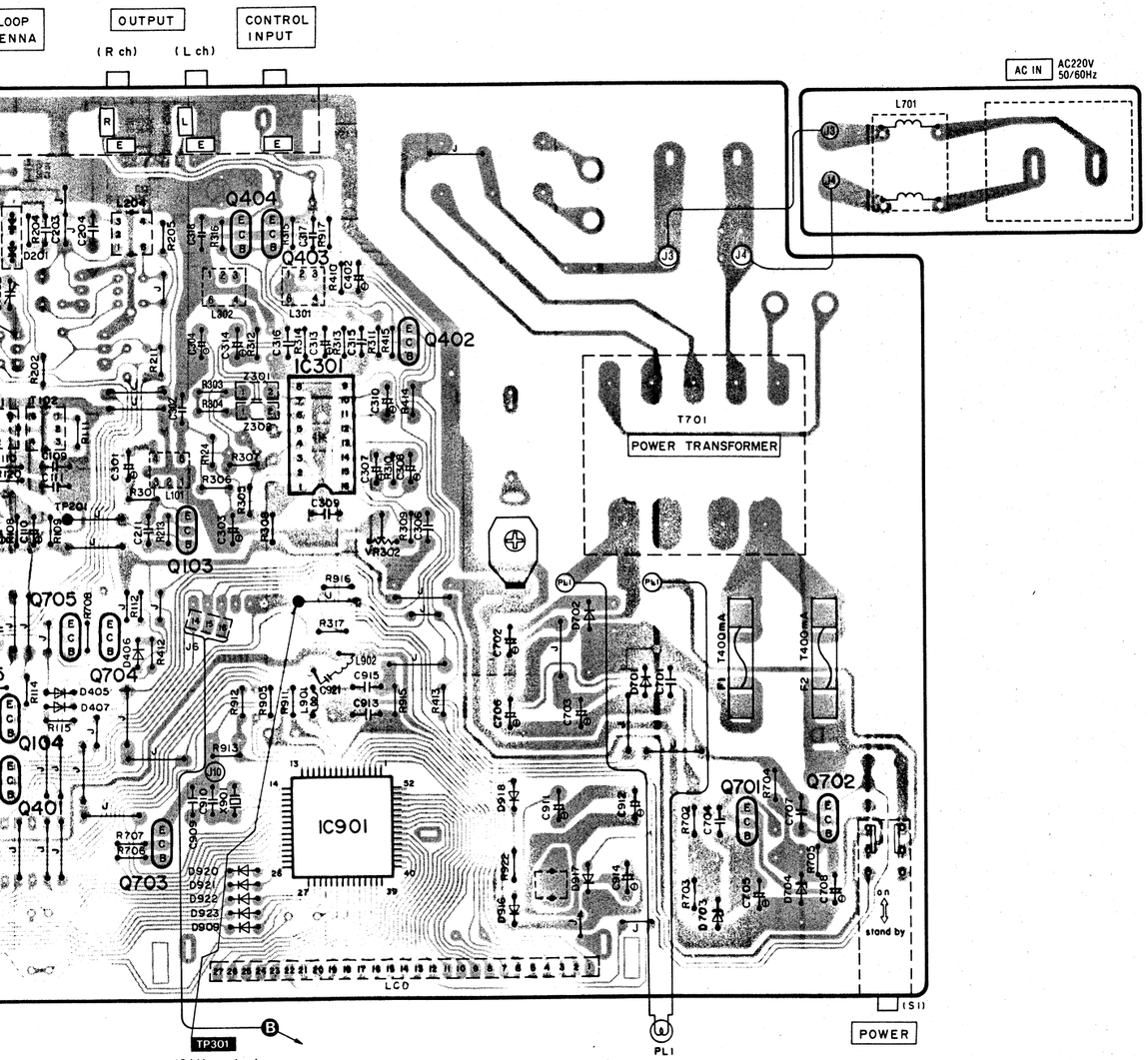
Ref. No.	Part No.	Description	
PACKING PARTS			
P1 [EK] ○	SPG5662	Carton Box	(1)
P1 [EK] Ⓚ	SPG5669	Carton Box	(1)
P1 ○ [EW, EB]	SPG5666	Carton Box	(1)
P1 Ⓚ [EW, EB]	SPG5667	Carton Box	(1)
P1 [EF]	SPG5670	Carton Box (MELUK)	(1)

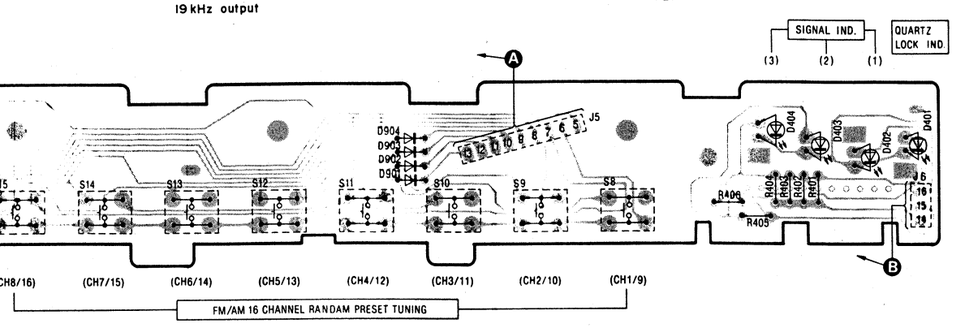
Ref. No.	Part No.	Description	
P2	SPS4588	Pad, Left Side	(1)
P3	SPS4589	Pad, Right Side	(1)
P4	SPS4552	Pad, Upper	(1)
P5 ○	XZB28X55C02	Polyethylene Bag	(1)
P5 Ⓚ	SPP734	Polyethylene Bag	(1)

Printed in Japan
860508000 Ⓗ NH. TN. MS

3 4 5 6 7

RING CONNECTION DIAGRAM




SIGNAL IND.
QUARTZ LOCK IND.
(3) (2) (1)
J5
S14 S13 S12 S11 S10 S9 S8
D904 D903 D902 D901
D404 D403 D402 D401
R406 R405
(CH8/16) (CH7/15) (CH6/14) (CH5/13) (CH4/12) (CH3/11) (CH2/10) (CH1/9)
FM/AM 16 CHANNEL RANDAM PRESET TUNING

Printed in Japan
860701100 Ⓗ TN/KS

ORDER NO. HAD8606594A2

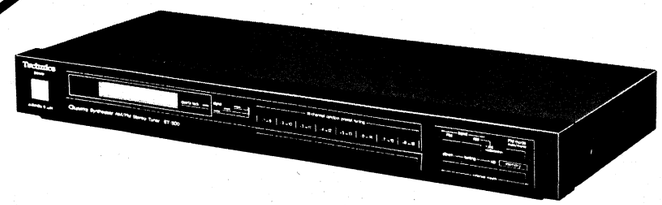
Service Manual

Supplement

QUARTZ
Synthesizer AM/FM Stereo Tuner

Tuner
ST-500

Color
(K)...Black Type
(S)...Silver Type



Color	Area
(K) (S)	[EG] ...F.R Germany.

Please use this manual together with the service manual for model No. ST-500/500L order No. HAD8605514C8.

TECHNISCHE DATEN

(DIN 45 500)

■ UKW-TUNERTEIL

Wellenbereich	87,50 ~ 108,00 MHz (0,05-MHz-Schritte)
Eingangsempfindlichkeit	1.5 µV/75Ω (IHF '58)
S/R 30 dB	1,3 µV (75 Ω)
S/R 26 dB	1,2 µV (75 Ω)
S/R 20 dB	0,9 µV (75 Ω)
Stereoumschaltschwelle bei 46 dB nach IHF	28 µV/75 Ω
Gesamtklirrfaktor	
Mono	0,15%
Stereo	0,3%
Geräuschabstand	
Mono	70 dB (78 dB nach IHF '58)
Stereo	65 dB (71 dB nach IHF '58)
Frequenzgang	20 Hz ~ 15 kHz (+0,5 dB ~ −1,5 dB)
Trennschärfe bei Störsender	
normal ±400 kHz	70 dB
Einfangverhältnis	1,0 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	90 dB
ZF-Dämpfung bei 98 MHz	90 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	100 dB
MW-Unterdrückung	55 dB
Übersprechdämpfung	
1 kHz	40 dB
Trägerrest	
19 kHz	−70 dB (−80 dB nach IHF)
38 kHz	−75 dB (−80 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,2 dB
Begrenzereinsatz	1,2 µV
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	75 Ω (unsymmetrisch)

■ MW-TUNERTEIL

Wellenbereiche	522 ~ 1611 kHz (9-kHz-Schritte) 530 ~ 1620 kHz (10-kHz-Schritte)
Eingangsempfindlichkeit (S/R 20 dB)	20 µV, 300 µV/m
Trennschärfe (±9 kHz)	55 dB
Spiegelfrequenz-Dämpfung bei 999 kHz	40 dB
ZF-Dämpfung bei 999 kHz	60 dB

■ ALLGEMEINE DATEN

Ausgangsspannung	0,6 V (1,0 V, IHF)
Leistungsaufnahme	9 W
Netzspannung	Wechselstrom 50 Hz/60 Hz. 220V
Abmessungen (B×H×T)	430 × 53 × 200 mm
Gewicht	1,8 kg

Bemerkung:
Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

(Die technischen Daten können infolge von verbesserungen ohne Ankündigung geändert werden).

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ REPLACEMENT PARTS LIST

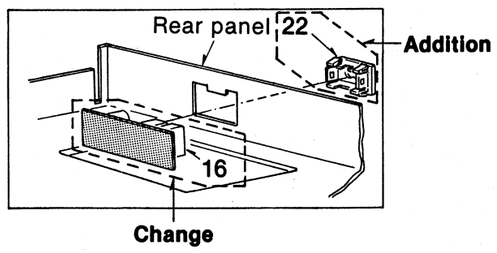
Notes:
- Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- The parenthesized numbers in the column of description stand for the quantity per set.

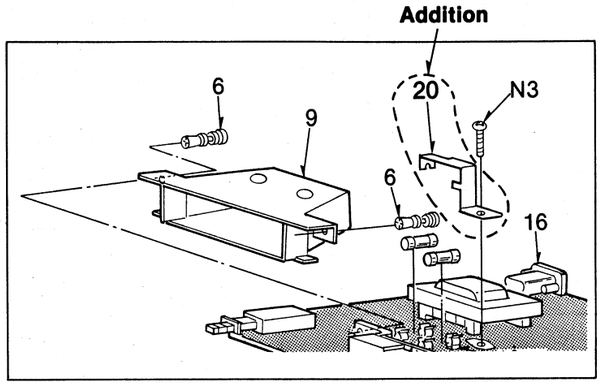
Ref. No.		Part No.	Description
INTEGRATED CIRCUITS			
IC101		AN7273A	Integrated Circuit
IC301		SVIUPC1161C3	Integrated Circuit
IC901		UPD1708G571	Integrated Circuit
TRANSISTORS			
Q101, 102		2SC2787L	Transistor
Q103~105, 403, 404, 703		2SC3311-Q	Transistor
Q401		2SC1685-S	Transistor
Q402, 704, 705 907		2SA1309Q	Transistor
Q701		2SC1384A-R	Transistor
Q702		2SC3311-Q	Transistor
Q902, 903		2SC2785F	Transistor
DIODES			
D201		KV1260Z	Diode
D401		LN846RP	L.E.D.
D402~404		LN446YP	L.E.D.
D405~407, 901~904, 909, 911, 914~918, 920~923		MA165	Diode
D701, 702	⚠	1SR35200	Rectifier
D703		MA4150M	Diode
D704		MA4062-M	Diode
D912, 913		MA162A	Diode
COILS			
L101		SLM1B1-P	B.P.F.
L201, 202		ELEPK1R0MA	Choke, 1μH
L204		SL02B7-M	AM OSC
L205		SLA2B1-1M	AM Antenna
L301, 302		SLM5B2-1P	L.P.F.
L701	⚠	SLQZ650MH49	Choke
L901		ELEPKR22MA	Choke, 0.22μH
L902		ELEPK1R2MA	Choke, 1.2μH
TRANSFORMERS			
T101		SLI4B511-Z	FM IFT
T102		SLI4B513-Z	FM IFT
T201		SLI2B101-M	AM IFT
T701	⚠	SLT5K199-S	Power Source
CERAMIC FILTERS			
CF101		SVFE107MZ2-A	FM, 10.7MHz (Red)
		SVFE107MZ2-D	FM, 10.65MHz (Black)
		SVFE107MZ2-E	FM, 10.75MHz (White)
CF102		SVFE107MM2-A	FM, 10.7MHz (Red)
		SVFE107MM2-D	FM, 10.65MHz (Black)
		SVFE107MM2-E	FM, 10.75MHz (White)
CF201		SVFSFZ450F7L	AM, 450kHz
CRYSTAL			
X901		SVQ49U452-T	4.5MHz, Counter OSC

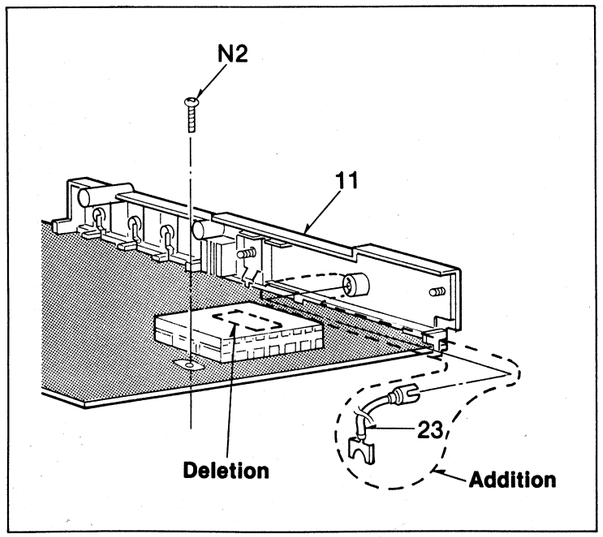
Ref. No.		Part No.	Description
VARIABLE RESISTOR			
VR302		QVNB3A00B472	FM MPX VCO Adj.
VARIABLE CAPACITOR			
CT202		ECRHA010D41	Trimmer
COMPONENT COMBINATIONS			
Z1		SLA4Z13-Z	B.P.F.
Z301, 302		EXRP102K473C	0.001μF, 47kΩ
LIQUID CRYSTAL DISPLAY			
LCD		SALHLC9225-6	
FM FRONT END			
		SNVFE306G19	FM Front End Pack
LAMP			
PL1	⚠	XAMS15S150	9.6V, 0.27A
FUSES			
F1, 2	⚠	XBA2C04TR0	250V, 400mA
SWITCHES			
S1	⚠	SSH1196	Power Source
S2~15		SSG13	Preset, Band Selector, FM Mode Tuning, Memory

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1	○	SGYT500-SE	Front Panel Ass'y	(1)
1	Ⓚ	SGYT500-KE	Front Panel Ass'y	(1)
1-1		SDU293F	Transparent Plate	(1)
2	○	SBC814	Preset Button Ass'y	(1)
2	Ⓚ	SBC814-1	Preset Button Ass'y	(1)
3	○	SBCTZ990-KM	Selector Button	(1)
3	Ⓚ	SBCTS75-KM	Selector Button	(1)
4		SUS793	Spring (Silver Type Only)	(1)
5	○	SBC815	Tuning Button	(1)
5	Ⓚ	SBC815-1	Tuning Button	(1)
6		SHR415	Nylon Pin	(1)
7		SDU296A	Filter	(1)
8		SMP409	Lamp Case	(1)
9		SHE170-1	Spacer	(2)
10	○	SKCTZ450L-SE	Cabinet Ass'y	(1)
10	Ⓚ	SKCTZ450L-KE	Cabinet Ass'y	(1)
11		SJF8612N	Terminal Board	(1)
13		SGPT500-SG	Rear Panel Ass'y	(1)
13-1		SKL297-1	Foot	(4)
14		LN041325P2	L.E.D. Ass'y	(1)
15	○	SBC666	Power Button	(1)
15	Ⓚ	SBC666-3	Power Button	(1)
16	⚠	SJS9231B	AC Inlet	(1)
19		SJT347	Fuse Holder	(4)
20		SUS772	Ground Plate	(1)
22		SJS9231A	AC Inlet Cover	(1)
23		SJE87-1	Cord	(1)
24		SJS5327	Connector (3P) (J6)	(1)
24		SJS5903	Connector (9P) (J5)	(1)
SCREWS				
N1		XTB3+8G	Tapping, ⊕3×8	(3)
N2		XTBS3+12F1	Tapping, ⊕3×12	(2)
N3		XTBS3+8JFZ1	Tapping, ⊕3×8	(9)
N4	○	SNE2095-4	Cabinet	(2)
N4	Ⓚ	SNE2095-5	Cabinet	(2)
N5		XTWS3+10Q	Tapping, ⊕3×10	(1)
ACCESSORIES				
A1		SQF12759	Instruction Book	(1)
A2	⚠	SJA171	AC Cord	(1)
A3		SJP2269	Pin Cord	(1)
A4		SSA270M	FM Antenna Cord	(1)
A5		SPB1139	Loop Antenna	(1)
PACKING PARTS				
P1	○	SPG5663	Carton Box	(1)
P1	Ⓚ	SPG5664	Carton Box	(1)
P2		SPS4588	Pad, Left Side	(1)
P3		SPS4589	Pad, Right Side	(1)
P4		SPS4552	Pad, Upper	(1)
P5	○	XZB28X55C02	Polyethylene Bag	(1)
P5	Ⓚ	SPP734	Polyethylene Bag	(1)

■ EXPLODED VIEW ([ ] Change from ST-500 [EX])

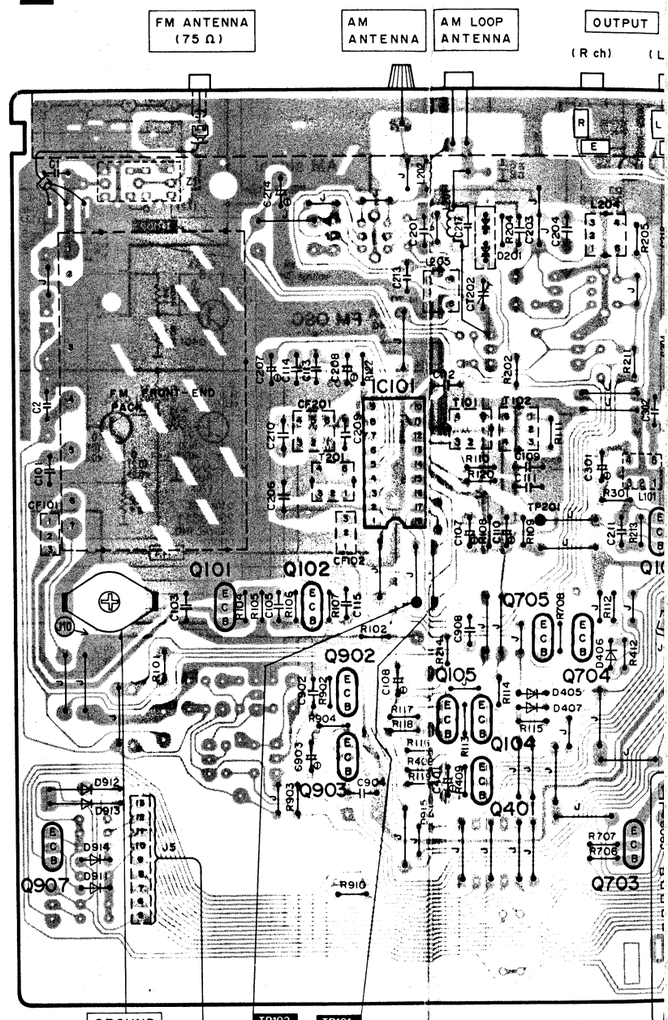




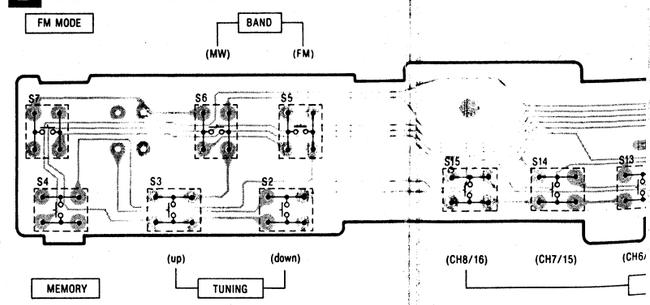


■ CIRCUIT BOARDS AND WIRING CONNE

A MAIN P.C.B.



B SWITCH/LED P.C.B.



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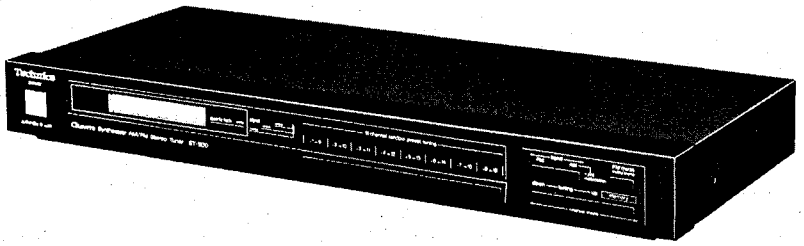
Tuner

ST-500



Color

(K)...Black Type
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Color	Area
(K) (S)	[EG] ...F.R Germany.

Please use this manual together with the service manual for model No. ST-500/500L order No. HAD8605514C8.

TECHNISCHE DATEN

(DIN 45 500)

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Stereoumschaltschwelle bei 46 dB nach IHF	28 µV/75 Ω
Gesamtklirrfaktor	
Mono	0,15%
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Einfangverhältnis	1,0 dB
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■ MW-TUNERTEIL

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	530 ~ 1620 kHz (10-kHz-Schritte)
Eingangsempfindlichkeit (S/R 20 dB)	20 µV, 300 µV/m
Trennschärfe (±9 kHz)	55 dB
Spiegelfrequenz-Dämpfung bei 999 kHz	40 dB
ZF-Dämpfung bei 999 kHz	60 dB

■ ALLGEMEINE DATEN

Ausgangsspannung	0,6 V (1,0 V, IHF)
Leistungsaufnahme	9 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 220V
Abmessungen (B×H×T)	430 × 53 × 200 mm
Gewicht	1,8 kg

Bemerkung:
Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

(Die technischen Daten können infolge von verbesserungen ohne Ankündigung geändert werden).

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ MEASUREMENTS AND ADJUSTMENTS (ADDITION)

Addition

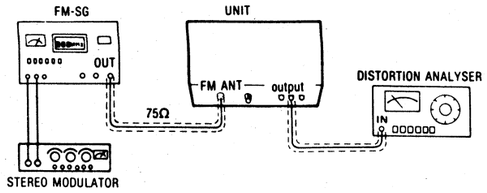
Note: For **T201 (AM-IFT), L204 (AM OSC coil), L301, L302 (19kHz/38kHz L.P.F) and L101 ("Antibirdy"-Filter)**, adjusted parts are supplied. So, do not turn the cores of this parts.

Addition

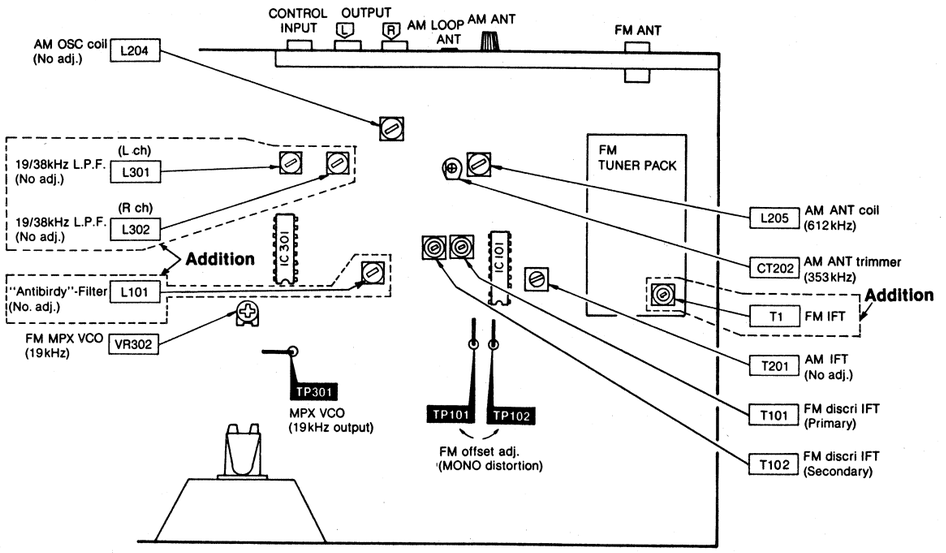
FM IFT ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit into "**FM on/auto**" position. (by FM mode select button.)
3. Place the radio frequency display and signal generator setting to **101.1MHz.**
4. Adjust **T1** so that distortion factor of Lch. is minimized.
5. Make sure that the distortion factors of Lch. and Rch. are Rch. are at minimum and nearly equal.

FM SIGNAL GENERATOR CONDITION
Modulation.....90% (Pilot 10%)
Modulation frequency.....L mode 400Hz (Pilot 19kHz)
Output level.....66dB



• Adjustment points (Addition)



■ RESISTORS AND CAPACITORS

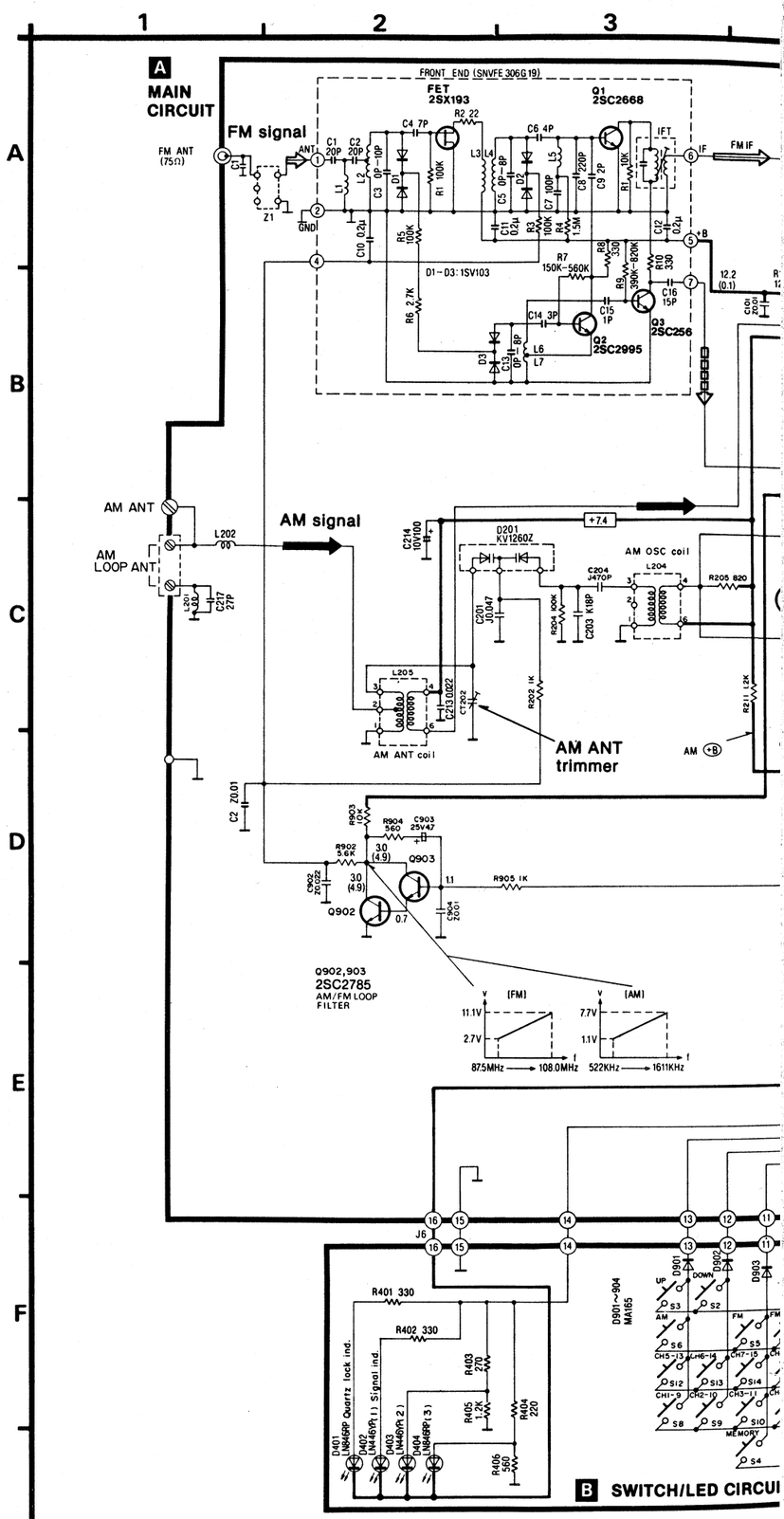
Notes:
- Please use this part number for parts order.
- Important safety notice. Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- The unit of resistance is OHM (Ω). K=1000Ω, M=1000kΩ
- The unit of capacitance is MICROFARAD (μF). P=10⁻⁶μF.

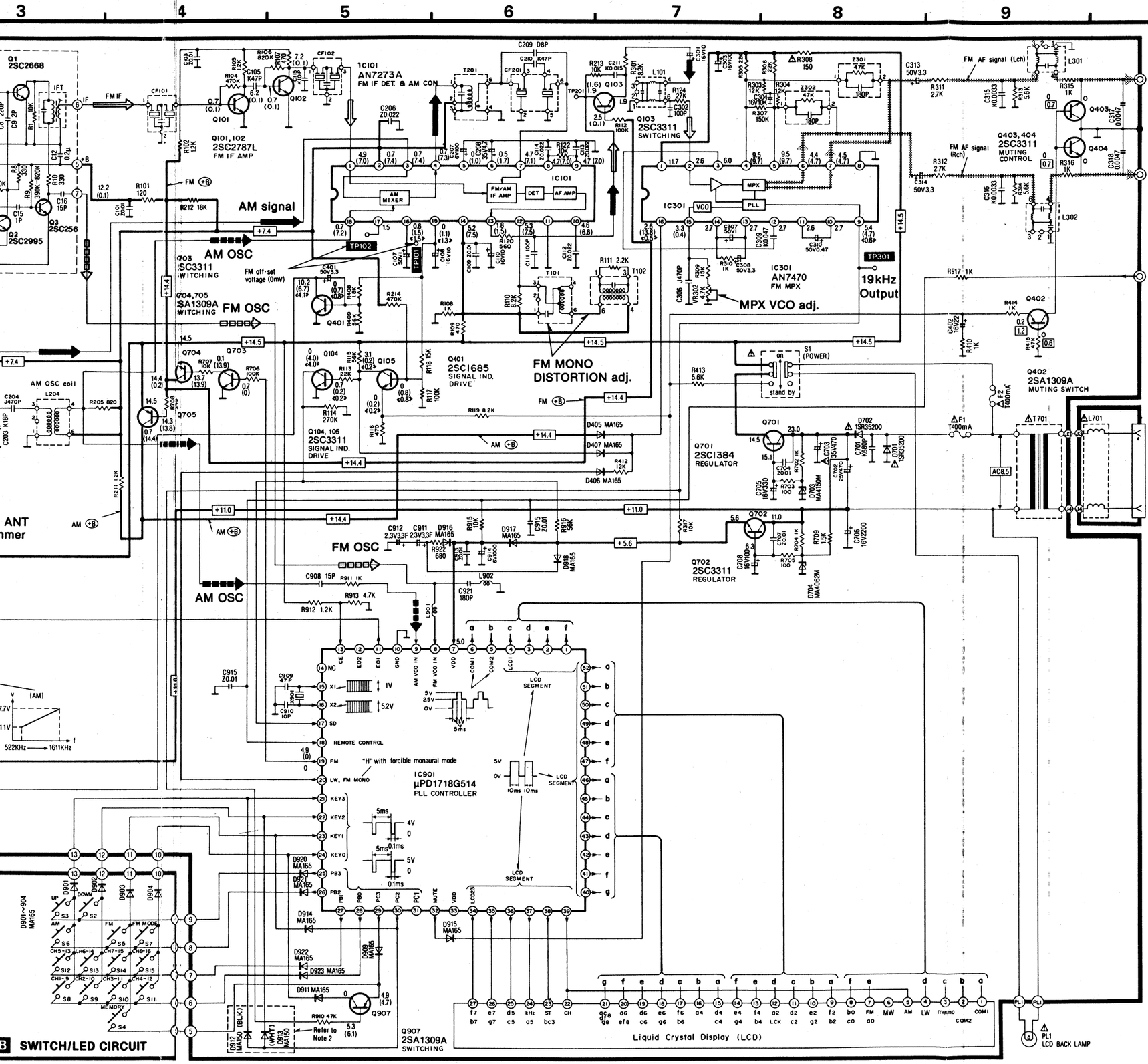
• CAPACITORS

Ref. No.	Part No.	Value
C1	ECCD1H330KC	33P
C2	ECKD1H103ZF	0.01
C101	ECKD1H103ZF	0.01
C103	ECKD1H103ZF	0.01
C105	ECCD1H470K	47P
C107	ECEA1HK010	1
C108	ECEA1CU100	10
C109	ECKD1H103ZF	0.01
C110	ECEA1CU100	10
C111	ECCD1H101K	100P
C112, 113	ECKD1H223ZF	0.022
C114	ECKD1H223ZF	0.022
C115	ECCD1H100KC	10P
C201	ECQM1H473JZ	0.047
C203	ECCD1H180KC	18P
C204	ECQP1471JZ	470P
C206	ECKD1H223ZF	0.022
C207	ECEA0JU101	100
C208	ECEA1VU4R7	4.7
C209	ECCD1H080CC	8P
C210	ECCD1H470K	47P
C211	ECFTD153KXL	0.015
C212	ECQP1391JZ	390P
C213	ECKD1H223ZF	0.022
C214	ECEA1AU101	100
C217	ECCD1H270K	27P
C301	ECEA1CU100	10
C302	ECCD1H101K	100P
C303	ECEA1CU101	100
C304	ECEA1CU100	10
C306	ECQP1471JZ	470P
C307	ECEA1HK010	1
C308	ECEA1HK3R3	3.3
C309	ECKD1H473ZF	0.047
C310	ECEA1HUR47	0.47
C313, 314	ECEA1HK3R3	3.3
C315, 316	ECFTD332KXL	0.0033
C317, 318	ECFTD472KXL	0.0047
C401	ECEA1HK3R3	3.3
C402	ECEA1CU220	22
C701	ECKD2H102ZF	0.001
C702	ECEA1EU471	470
C703 ⚠	ECEA1VU471	470
C704	ECKD1H103ZF	0.01
C705	ECEA1CU331	330
C706	ECEA1CU222	2200
C707	ECKD1H103ZF	0.01
C708	ECEA1CU101	100
C902	ECKD1H223ZF	0.022
C903	ECEA25M4R7R	4.7
C904	ECKD1H103ZF	0.01
C908	ECCD1H150K	15P
C909	ECCD1H470K	47P
C910	ECCD1H100KC	10P
C911, 912	EECW2R3A3R3E	3.3F
C913	ECKD1H103ZF	0.01
C914	ECEA0JU102	1000
C915	ECKD1H103ZF	0.01
C921	ECCD1H181K	180P

• RESISTORS

Ref. No.	Part No.	Value
R102	ERDS2TJ102	1K
R104	ERDS2TJ474	470K
R105	ERDS2TJ122	1.2K
R106	ERDS2TJ824	820K
R107	ERDS2TJ471	470
R108	ERDS2TJ102	1K
R109	ERDS2TJ471	470
R110	ERDS2TJ822	8.2K
R111	ERDS2TJ222	2.2K
R112	ERDS2TJ104	100K
R113	ERDS2TJ223	22K
R114	ERDS2TJ274	270K
R115	ERDS2TJ563	56K
R116	ERDS2TJ471	470
R117	ERDS2TJ104	100K
R118	ERDS2TJ153	15K
R119	ERDS2TJ822	8.2K
R120	ERDS2TJ561	560
R122	ERDS2TJ103	10K
R124	ERDS2TJ273	27K
R202	ERDS2TJ102	1K
R204	ERDS2TJ104	100K
R205	ERDS2TJ821	820
R211	ERDS2TJ122	1.2K
R212	ERDS2TJ183	18K
R213	ERDS2TJ103	10K
R214	ERDS2TJ474	470K
R301	ERDS2TJ822	8.2K
R303, 304	ERDS2TJ123	12K
R305, 306	ERDS2TJ223	22K
R307	ERDS2TJ154	150K
R308	ERDS2TJ151	150
R309	ERDS2TJ153	15K
R310	ERDS2TJ102	1K
R311, 312	ERDS2TJ272	2.7K
R313, 314	ERDS2TJ562	5.6K
R315, 316	ERDS2TJ102	1K
R317	ERDS2TJ103	10K
R401, 402	ERDS2TJ331	330
R403	ERDS2TJ271	270
R404	ERDS2TJ221	220
R405	ERDS2TJ122	1.2K
R406	ERDS2TJ561	560
R408	ERDS2TJ182	1.8K
R409	ERDS2TJ563	56K
R410	ERDS2TJ102	1K
R412	ERDS2TJ123	12K
R413	ERDS2TJ562	5.6K
R414	ERDS2TJ102	1K
R415	ERDS2TJ473	47K
R702	ERDS2TJ102	1K
R703	ERDS2TJ101	100
R704	ERDS2TJ102	1K
R705	ERDS2TJ101	100
R706	ERDS2TJ104	100K
R707	ERDS2TJ103	10K
R708	ERDS2TJ473	47K
R902	ERDS2TJ562	5.6K
R903	ERDS2TJ103	10K
R904	ERDS2TJ561	560
R905	ERDS2TJ102	1K
R910	ERDS2TJ473	47K
R911	ERDS2TJ102	1K
R912	ERDS2TJ123	12K
R913	ERDS2TJ562	5.6K
R915	ERDS2TJ103	10K
R916	ERDS2TJ563	56K
R917	ERDS2TJ102	1K
R922	ERDS2TJ681	680





■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Note 1:

- **S1** : Power switch in "on" position.
- **S2** : Tuning (down) switch.
  [down: tuning to lower frequency]
- **S3** : Tuning (up) switch.
  [up: tuning to higher frequency]
- **S4** : Memory set switch. (manual ↔ auto memory)
- **S5** : FM select switch.
- **S6** : AM select switch.
- **S7** : FM mode switch. (stereo ↔ mono)
- **S8~S15** : Preset tuning switch.
  * With it momentarily pushed (less than 0.4 sec.) and released, the 1~8 CH are received.
  * With it continuously pushed (0.4 sec. or more) and released, the 9~16 CH are received.
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
  All voltage values shown in circuitry are DC voltage in FM signal (no signal) reception modes.
  * Figures in ◄ ► stand for DC voltage in FM stereo signal reception mode.
  * Figures in ( ) stand for DC voltage in AM signal reception mode.
  * Figures in ▭ stand for muting mode.

  Positive voltage lines
  FM OSC
  AM OSC
  AF signal lines
  FM signal
  AM signal
- Important safety notice.
  Components identified by ⚠ mark have special characteristics important for safety.
  When replacing any of these components, use only manufacturer's specified parts.

Part No.	Original Part No.	Supply Part No.
IC301 D912, 913	AN7470 MA150	SVIUPC1161C3 MA162A

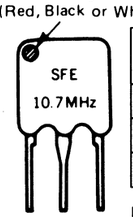
Note 2:

• Use of ceramic filters in pairs

The ceramic filters (CF101, CF102) for FM-IF circuit are available in three versions. For this circuit, be sure to use the ceramics of the same version in a pair.

At repairing and replacement, pay close attention to the diodes (D912, D913) for use as different diodes must be used depending on each version of the ceramic filters.

Color marking
(Red, Black or White)



VERSION (Color)	D912	D913	CENTER FREQUENCY
Black	○	×	10.65MHz
Red	×	×	10.70MHz
White	×	○	10.75MHz

Note: ○ mark: Diode is used.
× mark: Diode is not used.

* Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

■ REPLACEMENT PARTS LIST

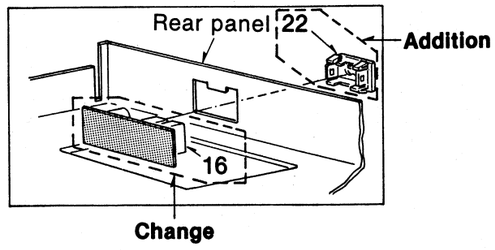
Notes:
- Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- The parenthesized numbers in the column of description stand for the quantity per set.

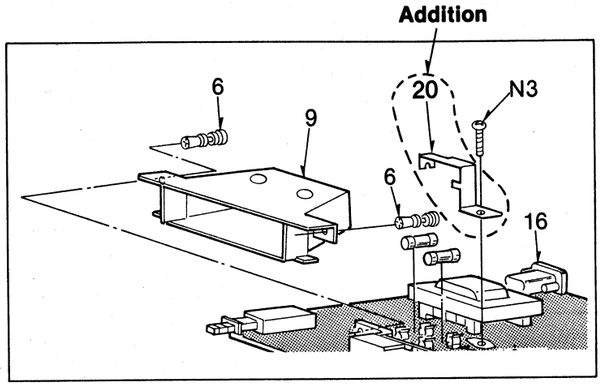
Ref. No.		Part No.	Description
INTEGRATED CIRCUITS			
IC101		AN7273A	Integrated Circuit
IC301		SVIUPC1161C3	Integrated Circuit
IC901		UPD1708G571	Integrated Circuit
TRANSISTORS			
Q101, 102		2SC2787L	Transistor
Q103~105, 403, 404, 703		2SC3311—Q	Transistor
Q401		2SC1685—S	Transistor
Q402, 704, 705 907		2SA1309Q	Transistor
Q701		2SC1384A—R	Transistor
Q702		2SC3311—Q	Transistor
Q902, 903		2SC2785F	Transistor
DIODES			
D201		KV1260Z	Diode
D401		LN846RP	L.E.D.
D402~404		LN446YP	L.E.D.
D405~407, 901~904, 909, 911, 914~918, 920~923		MA165	Diode
D701, 702	⚠	1SR35200	Rectifier
D703		MA4150M	Diode
D704		MA4062—M	Diode
D912, 913		MA162A	Diode
COILS			
L101		SLM1B1—P	B.P.F.
L201, 202		ELEPK1R0MA	Choke, 1μH
L204		SL02B7—M	AM OSC
L205		SLA2B1—1M	AM Antenna
L301, 302		SLM5B2—1P	L.P.F.
L701	⚠	SLQZ650MH49	Choke
L901		ELEPKR22MA	Choke, 0.22μH
L902		ELEPK1R2MA	Choke, 1.2μH
TRANSFORMERS			
T101		SLI4B511—Z	FM IFT
T102		SLI4B513—Z	FM IFT
T201		SLI2B101—M	AM IFT
T701	⚠	SLT5K199—S	Power Source
CERAMIC FILTERS			
CF101		SVFE107MZ2—A	FM, 10.7MHz (Red)
		SVFE107MZ2—D	FM, 10.65MHz (Black)
		SVFE107MZ2—E	FM, 10.75MHz (White)
CF102		SVFE107MM2—A	FM, 10.7MHz (Red)
		SVFE107MM2—D	FM, 10.65MHz (Black)
		SVFE107MM2—E	FM, 10.75MHz (White)
CF201		SVFSFZ450F7L	AM, 450kHz
CRYSTAL			
X901		SVQ49U452—T	4.5MHz, Counter OSC

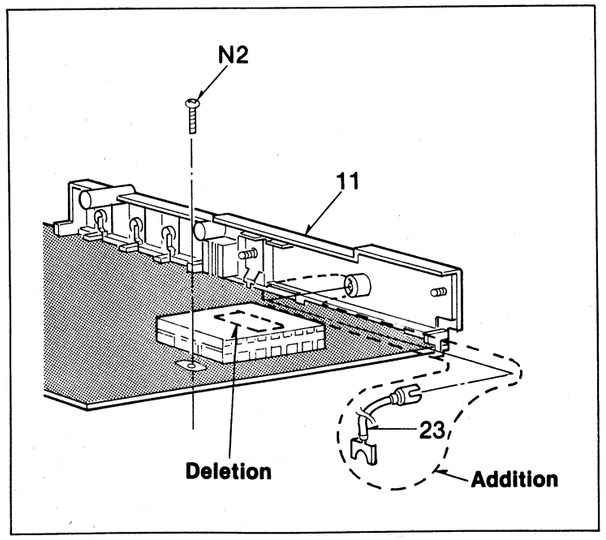
Ref. No.		Part No.	Description
VARIABLE RESISTOR			
VR302		QVNB3A00B472	FM MPX VCO Adj.
VARIABLE CAPACITOR			
CT202		ECRHA010D41	Trimmer
COMPONENT COMBINATIONS			
Z1		SLA4Z13—Z	B.P.F.
Z301, 302		EXRP102K473C	0.001μF, 47kΩ
LIQUID CRYSTAL DISPLAY			
LCD		SALHLC9225—6	
FM FRONT END			
		SNVFE306G19	FM Front End Pack
LAMP			
PL1	⚠	XAMS15S150	9.6V, 0.27A
FUSES			
F1, 2	⚠	XBA2C04TR0	250V, 400mA
SWITCHES			
S1	⚠	SSH1196	Power Source
S2~15		SSG13	Preset, Band Selector, FM Mode Tuning, Memory

Ref. No.		Part No.	Description
CABINET and CHASSIS PARTS			
1	○	SGYT500—SE	Front Panel Ass'y (1)
1	Ⓚ	SGYT500—KE	Front Panel Ass'y (1)
(1-1		(SDU293F	Transparent Plate (1)
2	○	SBC814	Preset Button Ass'y (1)
2	Ⓚ	SBC814—1	Preset Button Ass'y (1)
3	○	SBCTZ990—KM	Selector Button (1)
3	Ⓚ	SBCTS75—KM	Selector Button (1)
4		SUS793	Spring (Silver Type Only) (1)
5	○	SBC815	Tuning Button (1)
5	Ⓚ	SBC815—1	Tuning Button (1)
6		SHR415	Nylon Pin (1)
7		SDU296A	Filter (1)
8		SMP409	Lamp Case (1)
9		SHE170—1	Spacer (2)
10	○	SKCTZ450L—SE	Cabinet Ass'y (1)
10	Ⓚ	SKCTZ450L—KE	Cabinet Ass'y (1)
11		SJF8612N	Terminal Board (1)
13		SGPT500—SG	Rear Panel Ass'y (1)
(13-1		(SKL297—1	Foot (4)
14		LN041325P2	L.E.D. Ass'y (1)
15	○	SBC666	Power Button (1)
15	Ⓚ	SBC666—3	Power Button (1)
16	⚠	SJS9231B	AC Inlet (1)
19		SJT347	Fuse Holder (4)
20		SUS772	Ground Plate (1)
22		SJS9231A	AC Inlet Cover (1)
23		SJE87—1	Cord (1)
24		SJS5327	Connector (3P) (J6) (1)
24		SJS5903	Connector (9P) (J5) (1)
SCREWS			
N1		XTB3+8G	Tapping, ⊕3×8 (3)
N2		XTBS3+12F1	Tapping, ⊕3×12 (2)
N3		XTBS3+8JFZ1	Tapping, ⊕3×8 (9)
N4	○	SNE2095—4	Cabinet (2)
N4	Ⓚ	SNE2095—5	Cabinet (2)
N5		XTWS3+10Q	Tapping, ⊕3×10 (1)
ACCESSORIES			
A1		SQF12759	Instruction Book (1)
A2	⚠	SJA171	AC Cord (1)
A3		SJP2269	Pin Cord (1)
A4		SSA270M	FM Antenna Cord (1)
A5		SPB1139	Loop Antenna (1)
PACKING PARTS			
P1	○	SPG5663	Carton Box (1)
P1	Ⓚ	SPG5664	Carton Box (1)
P2		SPS4588	Pad, Left Side (1)
P3		SPS4589	Pad, Right Side (1)
P4		SPS4552	Pad, Upper (1)
P5	○	XZB28X55C02	Polyethylene Bag (1)
P5	Ⓚ	SPP734	Polyethylene Bag (1)

■ EXPLODED VIEW ([ ] Change from ST-500 [EX])

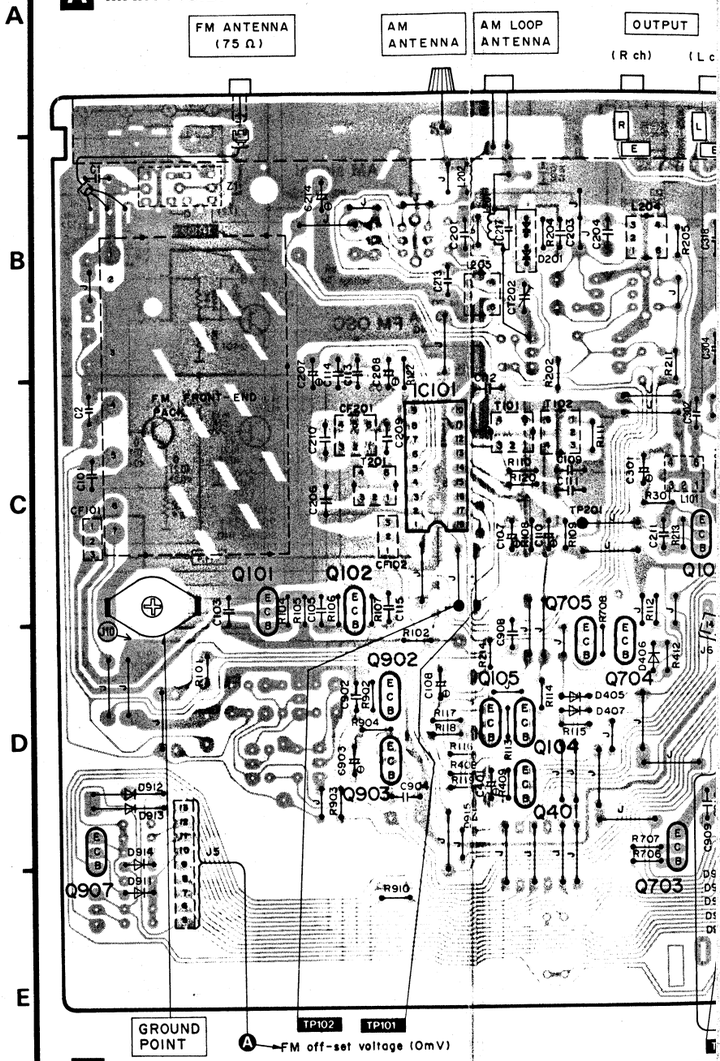




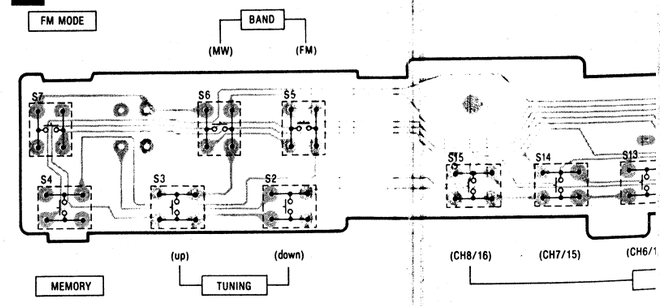


■ CIRCUIT BOARDS AND WIRING CONNEC

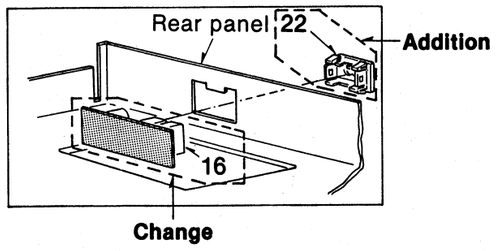
A MAIN P.C.B.

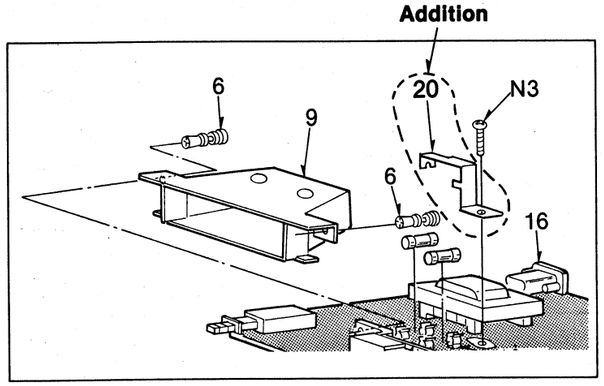


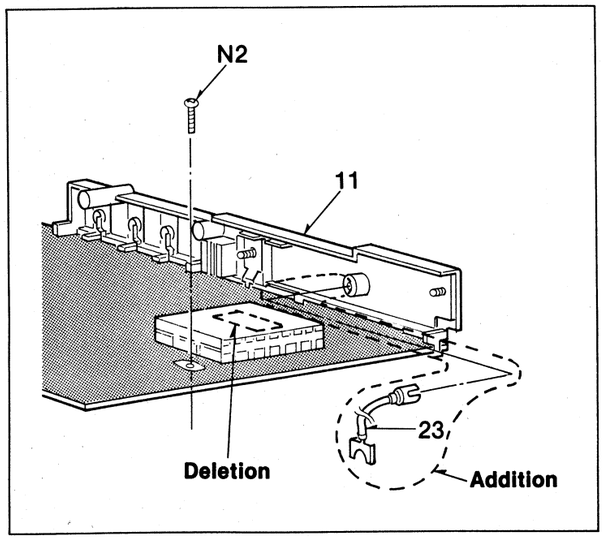
B SWITCH/LED P.C.B.



■ EXPLODED VIEW ([ ] Change from ST-500 [EX])







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Ass'y	(1)
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Button	(1)
	(1)
older	(4)
Plate	(1)
t Cover	(1)
	(1)
tor (3P) (J6)	(1)
tor (9P) (J5)	(1)
g, ⊕3×8	(3)
g, ⊕3×12	(2)
g, ⊕3×8	(9)
	(2)
	(2)
g, ⊕3×10	(1)
tion Book	(1)
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enna Cord	(1)
ntenna	(1)
Box	(1)
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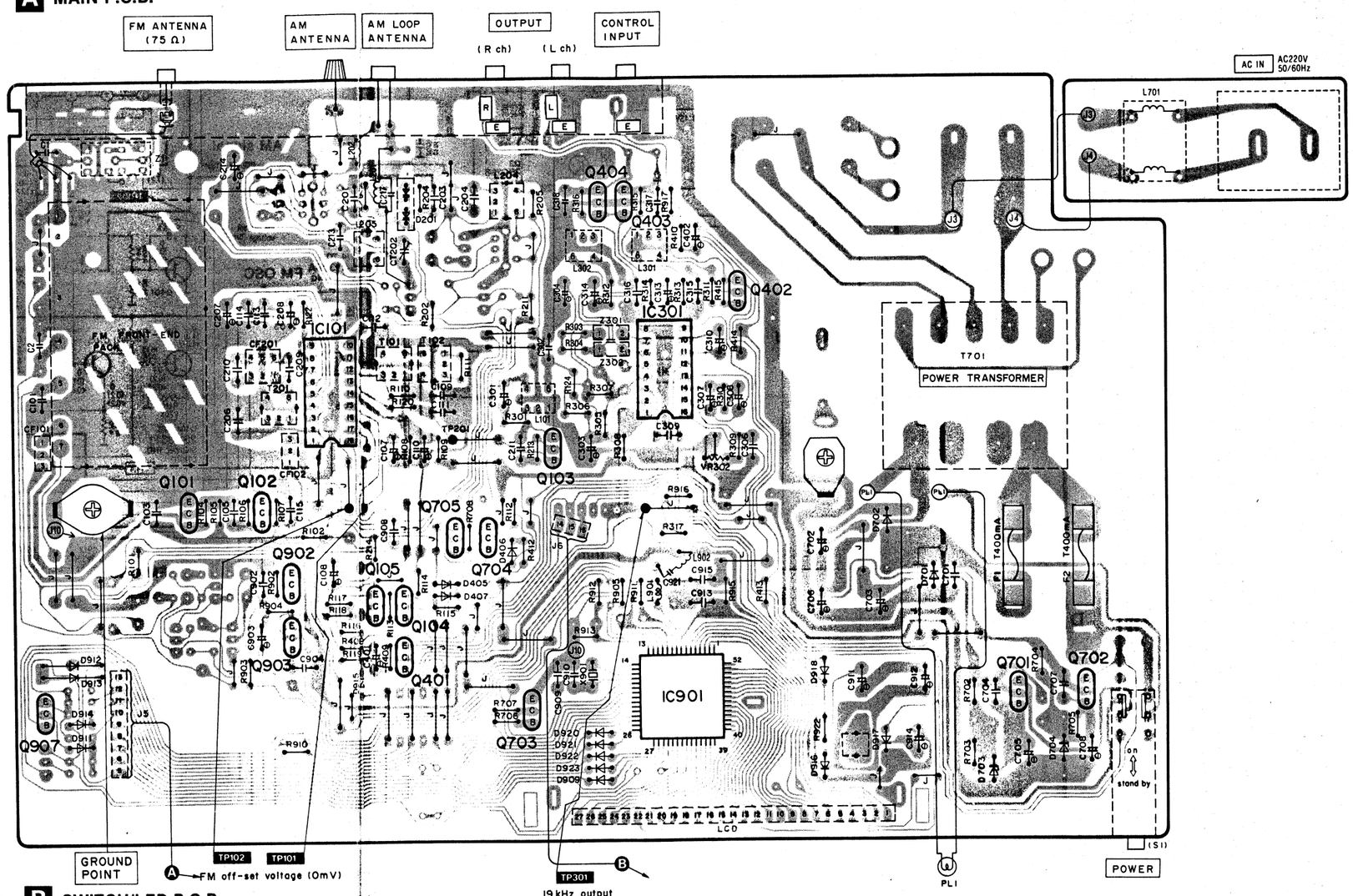
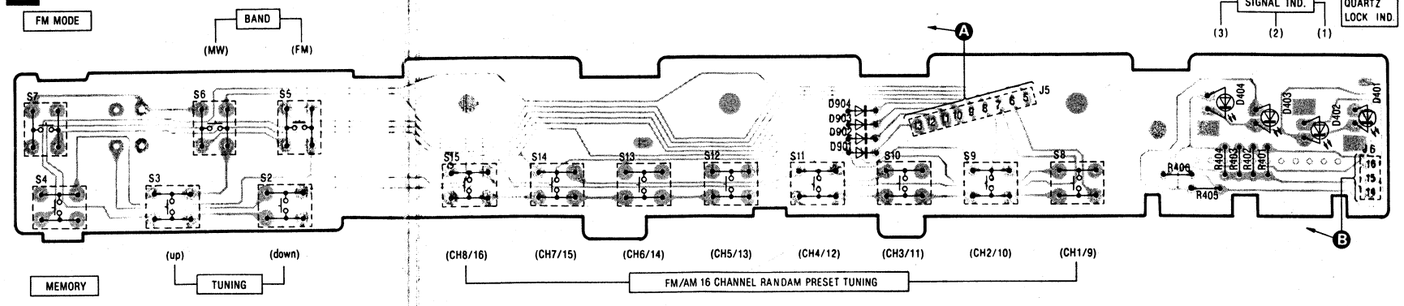
■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

A MAIN P.C.B.



B SWITCH/LED P.C.B.



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